

# Windows® IT Pro

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Windows Server 2008





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# Spam still driving everyone mad?



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# Don't Let the Economic Crisis Become an IT Crisis

## Keeping systems up and running through tough financial times

It's a time of dire predictions, gloomy forecasts and slashed budgets. But because companies must survive, it's also a time of doing everything possible to patch systems together and keep them running. System demand has never been higher, and because of the financial crunch, so has the necessity to "make do with what you've got." Those new servers will have to wait until next quarter. Those old workstations are going to have to hold up. It's a true test of an IT crew, kind of like a battleship's crew in combat.

Your company is heavily dependent on the performance you provide them. Any system downtime for any reason means lost time and profit. The same can be said for slow performance—the longer it takes to get something done, the longer a customer has to wait, the more possibility of being cut off by the competition or angering a customer so they go someplace else.

### Fragmentation Robs Production and Performance

File fragmentation is a key factor that cripples system performance and threatens reliability all across the enterprise. It causes system slowdowns resulting in lost production and help desk calls. It also allows for hard drive lives that can be shortened by 50 percent, due to the excessive I/O activity to retrieve fragmented files.

"We constantly had servers running slowly and getting really fragmented from constant file access," said Jim Bernal, Senior Network Engineer with Howe, Barnes, Hoefer & Arnett in Chicago, Illinois. "Over time, file access would almost halt or take minutes to access a file. We also had problems with users logging in with domain controllers sometimes rejecting users because of timeouts in communicating with our DNS servers."

Scheduled defragmentation—including the "free" offering—doesn't actually solve the problem. Time windows in which to schedule defrag have become less and less, thanks to escalating 24x7 server operation at



**"With fragmentation exerting such a severe toll on system performance, it's quite likely that many organizations have initiated hardware upgrades unnecessarily. By using an enterprise defragmentation utility, it is possible to achieve performance gains that meet or exceed many hardware upgrades. From a cost standpoint alone, this is an attractive proposition."**

— IDC White Paper, *Reducing Downtime and Reactive Maintenance: The ROI of Defragmenting the Windows® Enterprise*

many companies. In between the scheduled runs that do occur, fragmentation continues to build and impact performance. And scheduled defrag also causes its own cost overrun: the valuable IT time required to analyze and schedule defragmentation for each drive.

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"Since implementing Diskeeper on our servers and workstations, we've

improved system performance tenfold," said Mike Ciccarone, IT Coordinator with Town of Fountain Hills, Fountain Hills, Arizona. "The automatic defragmentation jobs not only improve system efficiency but the effectiveness of our limited Information Technology staff. We now have time to perform other necessary tasks to help support our users and to roll out new services."

"With Diskeeper, our servers have been up almost 99% of the time with no downtime, except to install updates from Microsoft® or when a server reboot was necessary," said Bernal. "And file access is lightning fast."

### Keeping Economic Troubles Out of IT

Don't let the economic crisis become an IT crisis. Put Diskeeper with InvisiTasking to work in your company—and put performance and reliability problems behind you.

"I think you can do the math on how much we saved not having to buy new machines, not to mention the manpower I did not have to use constantly working on the machines," said Derik A. Hammond, IT Operations Supervisor with L-3 Photonics in Carlsbad, California. "The savings to the programs and my stress level cannot be measured. It even looks like some of the machines will actually get close to a four-year life span due to Diskeeper."

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"I'd rather drive a Ferrari than a Ford,  
but cost is the kicker."



## OpenOffice 3.0 Challenges Microsoft Office's Dominance

Once considered a pale imitation, OpenOffice 3.0 is the best Office alternative yet

When it comes to office productivity suites, Microsoft Office has become the de facto standard for millions of companies, schools, organizations, and individuals. It also isn't cheap (\$500 retail for Office Professional 2007), a fact that isn't lost on cost-conscious IT pros. "As a small company, we have to maintain a tight IT budget," IT Director Jack Miller said in an email sent to *Windows IT Pro* back in 2007. "In 2005, we were still running Windows 98 and Microsoft Office 97. When Microsoft announced it wouldn't be supporting these products anymore, I knew we had to upgrade but didn't have enough money in my budget to upgrade both products." Miller opted for the Windows XP upgrade, dumping Microsoft Office in exchange for OpenOffice, an open-source alternative.

Miller's story isn't unique. As budgets get squeezed, many IT pros look for inexpensive alternatives to costly existing solutions. OpenOffice is a valid alternative for some, but the lack of file compatibility with Microsoft Office 2007 and a somewhat kludgy interface helped keep the product a niche player. OpenOffice 3.0 addresses many of those concerns. If you're an IT pro looking to migrate to Office 2007, you should give OpenOffice 3.0 a look; you can download it at [www.openoffice.org](http://www.openoffice.org). (A quick aside to the OpenOffice marketing team: Please dump the tortuous "OpenOffice.org" product name and stick with OpenOffice, which I've taken the liberty of doing in this column.)

After spending a few days with the latest release, I'm convinced that OpenOffice 3.0 can be a viable Office alternative for many. Like Microsoft Office, OpenOffice consists of several applications bundled in one suite, including a word processor, flat-file database, presentation program, and spreadsheet. Each of these separate OpenOffice apps offers a host of upgrades and improvements over OpenOffice 2.0, ranging from improved support for additional languages and better performance, to a new Start Center feature and a number of other interface and user-experience improvements. If you're accustomed to the pre-Office 2007 locations for your File, Edit, View, and other pull-down menus, OpenOffice will feel like a comfortable old shoe. Figure 1 shows the OpenOffice Start Center.

The biggest gripe many users had with OpenOffice was file incompatibility with Microsoft Office, and OpenOffice 3.0 goes a long way towards addressing that gripe. The new version now reads

(but does not write) Microsoft Office XML files such as the .docx, .xlsx, and .pptx formats. During my testing, these document types rendered well, with just a few minor errors and glitches, primarily in large, complex documents that make extensive use of advanced Office features (e.g., comments, revisions). OpenOffice 3.0 also supports Microsoft Access 2007 .accdb files, offers improved support for Visual Basic for Applications macros, and reads and writes the emerging ODF 1.2 and Office Open XML (OOXML) document formats. The OpenOffice community is also developing new plug-ins and feature improvements that you can download from the OpenOffice.org extensions repository at [extensions.services.openoffice.org](http://extensions.services.openoffice.org). And OpenOffice 3.0 is the first version of OpenOffice to offer a native OS X version for Macintosh users.



Figure 1. The OpenOffice Start Center

On a feature-to-feature comparison basis, Microsoft Office 2007 is clearly the more robust and capable application. I'd rather drive a Ferrari than a Ford, but cost is the kicker: How many people truly use all the features and functionality of every Microsoft

Office application? On the flipside, any IT pro will tell you that even free applications require resources for deployment, maintenance, and user training.

All that said, OpenOffice 3.0 is an undeniably attractive alternative to Office 2007 for many organizations. The Office suite has always been considered a cash cow for Microsoft, but new products such as OpenOffice 3.0—as well as cloud-based solutions such as Google Docs and Zoho—might force Redmond to put that bulky bovine on a "get more for less" exercise regimen.



InstantDoc 100545

**JEFF JAMES** ([jjames@windowsitpro.com](mailto:jjames@windowsitpro.com)) is senior editor, products, for *Windows IT Pro* and *SQL Server Magazine*. He specializes in virtualization and terminal services and has over 15 years of experience as a writer and digital-content producer.



## EDITORIAL

**Executive Director of Editorial and Strategy, IT Group**  
Karen Forster karen@windowsitpro.com

**Executive Editor, IT Group**  
Amy Eisenberg amy@windowsitpro.com

**Technical Director**  
Michael Otey mikeo@windowsitpro.com

**Web Site Strategic Editor**  
Anne Grubb agrubb@windowsitpro.com

**Executive Editor, Web and Industry**  
Jeff James jjames@windowsitpro.com

**IT Group Managing Editor**  
Cindy Bushong cindy.bushong@penton.com

**Systems Management**  
Barb Alexy Deputy Editor  
balex@windowsitpro.com

Karen Bemowski Senior Editor  
kbemowski@windowsitpro.com

Caroline Marwitz Associate Editor  
cmarwitz@windowsitpro.com

Zac Wiggy Assistant Editor  
zwiggy@windowsitpro.com

**Messaging, Mobility, SharePoint, and Office**  
Gayle Rodcay Senior Editor  
grodca@windowsitpro.com

Brian Keith Winstead Associate Editor  
bwinstead@windowsitpro.com

**Networking and Hardware**  
Jason Bobberg Senior Editor  
jbovberg@windowsitpro.com

**Security**  
Lavon Peters Senior Editor  
lpeters@windowsitpro.com

**SQL Server**  
Megan Bearly Keller Associate Editor  
mkeller@windowsitpro.com

Sheila Molnar Executive Editor, SQL Server  
and Developer  
smolnar@windowsitpro.com

**Storage, Backup and Recovery**  
Derek Maness Associate Editor  
dmaness@windowsitpro.com

**Production Editor**  
Brian Reinholz breinholz@windowsitpro.com

**Administrative Assistant**  
Mary Waterloo mwaterloo@windowsitpro.com

## IT Media Group Editors

Erin Bradford  
Cassie Deemer  
Vicki Hamende  
Linda Harty  
Chris Maxcer  
Rita-Lyn Sanders

## ART & PRODUCTION

**Senior Art Director**  
Larry Purvis lpurvis@windowsitpro.com

**Art Director**  
Layne Petersen layne@windowsitpro.com

**Production Director**  
Linda Kirchgesler linda@windowsitpro.com

**Senior Production Manager**  
Kate Brown kbrown@windowsitpro.com

**Assistant Production Manager**  
Erik Lodermeier erik.lodermeier@penton.com

## CONTRIBUTORS

**News Editor**  
Paul Thurrott news@windowsitpro.com

**SharePoint and Office Community Editor**  
Dan Holme danh@intelliem.com

**Senior Contributing Editors**  
David Chermicoff david@windowsitpro.com  
Mark Joseph Edwards mje@windowsitpro.com  
Kathy Ivens kiveness@windowsitpro.com  
Mark Minasi mark@minasi.com  
Paul Robichaux paul@robichaux.net  
Mark Russinovich mark@sysinternals.com

**Contributing Editors**  
Alex K. Angelopoulos aka@mvps.org  
Jerry Cochran jerryco@microsoft.com  
Sean Deuby sdeuby@windowsitpro.com  
Michael Dragone mike@mikerochip.com  
Jeff Felling jeff@blackstatic.com  
Brett Hill brett@iisanswers.com  
Darren Mar-Elia dmarella@windowsitpro.com  
Tony Redmond tony.redmond@hp.com  
Ed Roth eroth@windowsitpro.com  
Eric B. Rux ericrux@whshelp.com  
William Sheldon bsheldon@interknowlogy.com  
Randy Franklin Smith rsmith@montereytechgroup.com  
Curt Spanburgh cspanburgh@scg.net  
Orin Thomas orin@windowsitpro.com  
Douglas Toombs help@toombs.us  
Ethan Wilansky ewilansky@windowsitpro.com

## CUSTOM MEDIA

**Custom Media Director**  
Michele Crockett mcrockett@windowsitpro.com  
970-203-2924

**Group Editorial Director**  
Dave Bernard dbernard@windowsitpro.com



**Chief Executive Officer**  
Sharon Rowlands Sharon.Rowlands@penton.com

**Chief Financial Officer/Executive Vice President**  
Jean Clifton jean.clifton@penton.com

**Chief Revenue Officer**  
Darrell C. Denny Darrell.Denny@penton.com

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We're in IT with You

## Senior Vice President, Technology Media Group

Kim Paulsen kpaulsen@windowsitpro.com

## International Publisher

Jeff Lewis jlewis@windowsitpro.com  
970-613-4960

## Group Administrative Manager

Danna Varnell dvarnell@windowsitpro.com

## Group Interactive Publisher

Peg Miller pmiller@windowsitpro.com

## EMEA Managing Director

Irene Clapham irene.clapham@penton.com

## ADVERTISING SALES

## Director of Sales

Birdie J. Ghiglione birdie.ghiglione@penton.com  
619-442-4064

## Key Account Directors

Jeff Carnes jeff.carnes@penton.com  
678-455-6146

Chrissy Ferraro christina.ferraro@penton.com  
970-203-2883

Richard Resnick richard.resnick@penton.com  
951-302-2998

Jacquelyn Baillie jacquelyn.baillie@penton.com  
714-623-5007

Jeff Lewis jlewis@windowsitpro.com  
970-613-4960

## Account Executives

Kelly Koza, Midwest kelly.koza@penton.com  
970-203-2932

Barbara Ritter, West Coast barbara.ritter@penton.com  
858-759-3377

Cass Schulz, East Coast cassandra.schulz@penton.com  
858-357-7649

## Client Project Managers

Michelle Andrews michelle.andrews@penton.com  
970-613-4964

Kim Eck kim.eck@penton.com  
970-203-2953

## Ad Production Supervisor

Glenda Vaught glenda.vaught@penton.com

## REPRINTS

## Reprint Sales

Diane Madzelonka Diane.madzelonka@penton.com  
216-931-9268  
888-858-8851

## MARKETING & CIRCULATION

## Customer Service

800-793-5697 (US and Canada)  
44-161-929-2800 (Europe)

## IT Group Audience Development Director

Marie Evans marie.evans@penton.com

## Renewal Marketing Manager

Tricia McConnell tricia@windowsitpro.com

## Online Marketing Manager

Anne Oaks anne.oaks@penton.com

## Marketing Associate

Christan Humphries christan.humphries@penton.com

## Marketing Director

Sandy Lang sandy.lang@penton.com

## Marketing Coordinator

Andrea Knudson andrea.knudson@penton.com

www.windowsitpro.com



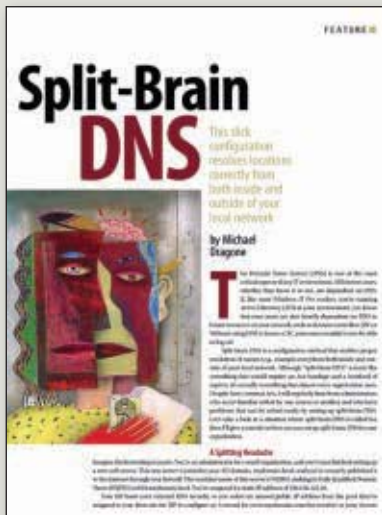
■ Split-Brain DNS  
■ Dogfooding

■ Championing 64-bit  
■ PowerShell 101

## Split-Brain DNS Clarification

I don't claim to be a DNS expert, but I think Michael Dragone's article—"Split-Brain DNS" (September 2008, InstantDoc ID 99772)—needs clarification. If a domain has sites that exist internally and externally and will have both internal and external users, you must have records on both the internal and external zones. Otherwise, internal queries for an external site that doesn't exist in the internal zone will fail. The internal DNS server finds the zone locally, and when it doesn't find the host you're looking for, it gives up without forwarding up to a higher name server.

—John Meola



In the article, I assume that an external zone is already set up and that an internal zone is being added. Although it's not specifically stated that you must add additional host records for your domain and not just a record for www (as the example shows), such is indeed the case. Note that these zones don't have to—and likely won't—identically match. Your internal zone is likely to resolve queries to private IP addresses instead of public IP addresses as your external one will, and you might not need all the host names in both. For example, there would be little need to resolve "remote vpnaccess.mydomain.com" internally.

—Michael Dragone

## LETTERS@WINDOWSITPRO.COM

### Do We Really Want Dogfood?

Has it occurred to anyone that the phrase *dogfooding* (a vendor's practice of using the same products it sells to customers) implies that the product is dogfood and that the customers are dogs? Maybe we should consult an oracle before we dream up more industry-standard terms ... or at least a common heckler.

—Thomas Inwood

### 64-Bit Champion

I was dismayed to read Ken Spinks's letter in the October 2008 edition of *Windows IT Pro* because it reinforced a common misconception about 64-bit systems. He writes that he bought a lesser PC for his wife because he "didn't want extra (i.e., 64-bit related) problems with printers, scanners, cameras, or software." The assumption is that 32-bit drivers will be more prevalent and better than their 64-bit counterparts. However, the exact opposite is true.

For Windows Vista logo certification, Microsoft required only 64-bit drivers, which means these were the only drivers that experienced the rigorous testing required for certification. My personal experience bears this out: My business laptop running the 64-bit version of Vista Ultimate works with all my peripherals and is far more stable and reliable than the 32-bit version of Vista Ultimate that I run on my home PC. Mr. Spinks could have still run a 32-bit version of Vista on the upscale PC that he passed over. PCs with 64-bit AMD or Intel processors are fully backward-compatible and will run either a 32-bit or 64-bit OS.

—Alan J. Walsh

### Disabling Automatic SUA Startup?

I enjoyed John Howie's "Move Apps from UNIX to Windows with SUA" (September 2008, InstantDoc ID 99588). I'm considering

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using the feature in Vista, but I'm curious whether Subsystem for UNIX-Based Applications (SUA) must start up with Windows. I'd like to disable automatic SUA startup at system startup and instead have it launch only when I run an SUA application. Can I do that?

—Jonathan Hanson

*SUA isn't a traditional Windows service; it's an optional subsystem, started when the system boots. In the days of Windows NT, both the OS/2 and POSIX subsystems shipped "in the box." Now, POSIX is an optional extra. It's configured in the HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\Session Manager\SubSystems\Option registry subkey (of type REG\_MULTI\_SZ and value Posix). If the registry entry is present, you'll see another subkey (under the same key) called Posix, which contains the value %SystemRoot%\system32\psxs.exe. This is the POSIX subsystem executable, which runs at startup. There's no support for starting it after the system has started.*

—John Howie

### PowerShell Knockout

I just want to commend *Windows IT Pro* on Robert Sheldon's fantastic PowerShell series ("PowerShell 101," February–July 2008). And you capped it off in September with the five-page knockout "Managing AD User Accounts with PowerShell" (InstantDoc ID 99760). Articles like these are the reason I subscribe to your magazine.

—Adeogun Adedamola  
InstantDoc ID 100596

**Oops!**

In the comparative review on "SharePoint Backup Tools" (November 2008, InstantDoc ID 100126), the price for Quest Software's Recovery Manager for SharePoint should have been \$4,995. We apologize for the error.



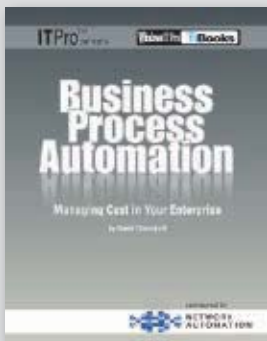
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## Cloud Computing: Future or Farce?

The search for truth amidst rumors and buzzwords

I never believed in Santa Claus. This revelation shocks most everyone who hears it. I have to look into the concerned, slightly teary eyes of the person I'm talking with and confirm that I never made cookies for an old, fictitious man in anticipation of his breaking and entering to give me material goods for doing exactly what I was supposed to do anyway: behave. But I turned out just fine—albeit a little cynical. And as I read the Windows IT Pro network coverage about cloud computing, I'm beginning to suspect that the reasons behind the cloud computing rage may be just as fictitious as ol' Saint Nick.

In a May 25 blog post on the SuperSite for Windows ([www.windowsitpro.com/go/cloudcomputing](http://www.windowsitpro.com/go/cloudcomputing)), Paul Thurrott describes cloud computing as “obtaining computing resources—processing, storage, messaging, databases and so on—from someplace outside your own four walls, and paying only for what you use.” And in the August 2008 web-exclusive article “Gartner: Cloud Computing Is Reshaping IT” (InstantDoc ID 100115), Paul further touts the potential of cloud computing, stating, “In many ways Gartner is just waking up to what much of the IT world has understood for years: Cloud computing is real, it's happening now, and it will transform IT.”

But just as I start to believe, I see comments from readers that put a raincloud over my head. Commenting on Paul's May blog post, reader Suraky said that cloud computing is “just another meaningless buzzword.” And in response to the August web-exclusive article, Bruce Arnold commented, “The only true cloud computing

## November's Online Gold Mine

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- A Q&A on Internet Explorer Content Advisor (InstantDoc ID 100614)
- Part two on System Center Data Protection Manager 2007 (InstantDoc ID 100549)
- Recover deleted files in Outlook (InstantDoc ID 100556)

takes place in aircraft. What they're actually referring to by ‘the cloud’ is a large-scale and often remotely located and managed computing platform. We have had those since the dawn of electronic IT.” He goes on to write that “any journalist that makes a buzz out of cloud computing and web 2.0 should probably be on the market for a job instead of wasting time talking nonsense.” (Hopefully this counts as more of a rumble than a buzz.)

In my search for better understanding, I turn to Executive Editor Amy Eisenberg. In her blog post “TechEd in the Cloud” (InstantDoc ID 99433), Amy expresses her initial feeling of déjà vu: “While the name might be new, the concept is not. The basic idea is Internet software delivery. Can you say hosted services?” She goes on to say that she's warmed up to cloud computing because “times have changed.”

So help me through this haze called cloud computing: Is it worth believing in or is it just an old, dressed-up uncle trying to fool everyone?



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# Thurrott

NEED TO KNOW

"A primary advantage of VMM 2008 over VMware tools is that the Microsoft product can see further into each VM than can its competition."

## Microsoft System Center Virtual Machine Manager 2008

**W**ith Microsoft's virtualization platform reaching maturity in 2008, the company's offerings now span the PC desktop, small-to-mid-sized businesses (SMBs), enterprises, and even the largest data centers. What's missing is centralized management, especially in large environments.

Businesses need ways to manage environments in which virtual and physical machines interact, automate the distribution of virtualized resources, and consolidate legacy physical servers into virtual environments. The new version of Microsoft's virtual environment management product addresses those needs. Here's what you need to know about Microsoft System Center Virtual Machine Manager 2008 (VMM 2008).

### What Is VMM 2008?

VMM is a data-center management server that provides functionality specific to virtualized environments. Key functionality includes the ability to convert legacy and underutilized hardware servers into virtual machines (VMs); provision, deploy, and manage VMs and other virtual assets; and automatically optimize a virtualized infrastructure. VMM 2008 also provides virtual-to-virtual (V2V) conversion facilities for moving VMs off of VMware ESX Server.

### Heterogeneous Management

VMM 2008 can manage all of Microsoft's virtual environment server products, including Microsoft Virtual Server 2005 R2, Windows Server 2008 Hyper-V, and Microsoft Hyper-V Server 2008. That's to be expected. But it can also manage VMware ESX Server, a surprising boon for those who run heterogeneous environments.

In a recent briefing, Microsoft program manager David Armour told me that VMM 2008 treats ESX Server as a "first-class citizen," providing access to the most frequently needed ESX Server management functions. But it also lets you leverage unique VMM functionality, such as automated VM placement, VMM's Microsoft SQL Server 2005-based library, and the like.

As a member of the System Center family of management products, VMM 2008 produces and can consume System Center alerts and can trigger actions based on those alerts. This integration with key System Center products such as Operations Manager 2007 means that it's possible to monitor physical and virtual machines from a single interface, while leveraging virtualization-specific functionality. The VMM 2008 UI is also similar to that of other System Center products

and is modeled after that of Ops Manager, helping admins get up and running quickly.

And as with many other recent Microsoft administrative consoles, the VMM console is built entirely on top of Windows PowerShell—so everything you can do from the GUI is possible via scripting as well. It's also possible to perform actions in the GUI and find out what underlying scripts are used to perform those actions, then use those scripts as the basis for automated routines of your own.

### Automated VM Deployment

VMM 2008 analyzes the virtualization hosts in your environment and recommends the most appropriate physical servers for your virtualized workloads. This feature, called Intelligent Placement, can also work in an automated fashion if desired, moving virtual assets from host to host as needed and on the fly. After VMs are deployed, you can monitor their settings and manage their placement accordingly.

The VMM 2008 library provides a central location for managing and storing virtual assets such as VMs, virtual hard disks (VHDs), ISO files, profiles, customization scripts and sysprep answer files, and templates. You can implement multiple libraries in large, distributed environments to prevent WAN-based performance problems.

A new VMM 2008 feature, Performance and Resource Optimization (PRO), optimizes virtualized resources using performance and health data provided by Ops Manager 2007 management packs. VMM 2008 also integrates with the failover clustering feature in Windows Server 2008, giving your virtualized environments cluster-aware, high-availability functionality.

### Installing and Using VMM 2008

Unlike Microsoft's free VM management tool, Hyper-V Manager, VMM 2008 must be installed in an Active Directory (AD) domain. (VM hosts don't need to be domain members, however.) It can be installed on top of Server 2008 x64 only and includes a copy of SQL Server 2005 Express, which the VMM library and reporting functionality require. It can also use existing SQL Server installations, including SQL Server 2008. You can install the VMM 2008 admin console on Windows Vista SP1, Windows Server 2003, and Windows XP SP3. A self-service portal, which you can install on Server 2008 and Windows 2003R2, lets you provide VMM functionality via an intranet. You need to install a VMM 2008 agent on each host and library server.

Compared to Hyper-V Manager, VMM 2008 offers an amazing amount of additional functionality. The UI is more sophisticated and



## Recommendations

VMM 2008 is a sophisticated solution and is far more capable than the freebie Hyper-V Manager, as expected. But what makes VMM 2008 so compelling is its interoperability prowess: It works with all of Microsoft's virtualization servers and with VMware ESX Server. It integrates with System Center and provides a seamless, centralized management interface for physical and virtual machines. And it can utilize the failover and high-availability features of Server 2008 to provide data-center-ready virtualized environments. Ultimately, VMM 2008 will most interest those who manage large data centers. But it will make deploying and managing virtualized environments easier for businesses of all sizes.

InstantDoc ID 100524

**PAUL THURROTT** (thurrott@windowsitpro.com) is the news editor for *Windows IT Pro*. He writes a weekly editorial for *Windows IT Pro UPDATE* (www.windowsitpro.com/email) and a daily Windows news and information newsletter called *WinInfo Daily UPDATE* (www.wininformant.com).

provides advanced filtering and host groups, letting you view logical groups of VMs on any number of physical hosts in a single view. A resizable preview window lets you view running VMs, limiting the need to connect to the VM and open it in a separate window. This filtering and grouping also makes managing clusters of VM hosts much easier.

Most of VMM 2008's advanced tools are accessible via simple wizards. The Migrate Virtual Machine Wizard rates potential target hosts in a migration and lets you easily pick an appropriate destination. Migration of Hyper-V-based VMs is not instantaneous, but is nearly so; migration of ESX Server VMs, however, is instantaneous thanks to that system's live migration facilities. (Live Migration is coming to Hyper-V in Windows Server 2008 R2.) Every wizard has a View Script button, so you can see the PowerShell code that's being generated under the hood and apply it to your own scripts.

In use, VMM 2008's library is a veneer over the underlying file system. As you navigate through subfolders such as ISOs, Scripts,

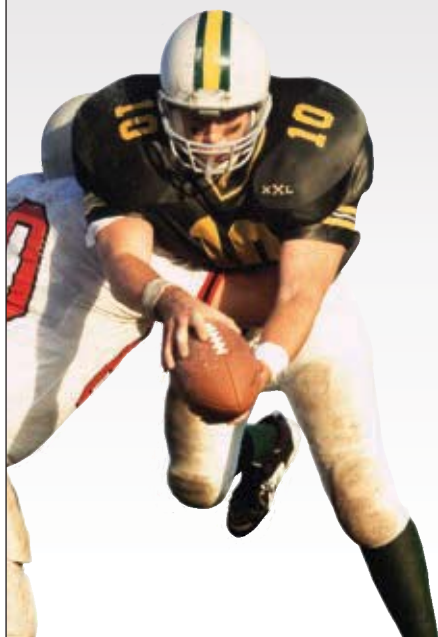
Templates, and VHDs, you're seeing a representation of these objects as they are literally stored in Explorer.

The VMM 2008 Self-Service Portal is interesting as well. This web application lets end users start, stop, and pause VMs, make check points, and perform other related actions, all without involving a support call. Available VMs can be shown in a text-based list view or a more graphical thumbnail view, which provides a live glimpse into the running VMs.

A primary advantage of VMM 2008 over VMware tools is that Microsoft can see further into each VM than can its competition. Thanks to the System Center management pack integration, you can dig into each VM and manage the underlying workloads as well.

So whereas VMware is limited to identifying the OS utilized by the VM, VMM 2008 can go further and, for example, determine whether Microsoft IIS is installed. Then you can view the event log and perform other lower-level work.

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"The extremely complex mathematics underlying product-key and license verification add up to one of the most important weapons in Microsoft's arsenal in its war on piracy."

## Control Your Licensing with Slmgr

Tame the necessary evil that is Windows Product Activation

**T**he annoyance that is Windows Product Activation used to plague only small businesses and home PC users, but now that Windows Vista and Windows Server 2008 use it, we *all* have to grapple with it. Your primary client-side tool for managing a system's software licensing is called Slmgr (slmgr.vbs). Need to change a product key or activate a system from the command line? Want to extend Server 2008's 60-day grace period to 240 days? Not sure whether your computer's license is a volume, retail, or OEM license? If so, you need Slmgr.

### Putting It to Work

If you have systems without a GUI or systems that need to activate via a batch file, Slmgr's -ato option is useful. To activate a system, simply open an elevated command prompt and type

```
slmgr -ato
```

If you're working on a system that's using either a retail copy or a volume license copy of Windows that's been activated with the Multiple Activation Key (MAK), Slmgr attempts to contact Microsoft's activation web servers. However, if the system is running a copy of Windows built from the volume license media and has been activated with the Volume License Key (VLK), Slmgr knows that it should instead try to contact your organization's Key Management Server (KMS). When Slmgr requires Microsoft's servers, it already knows those Internet addresses. But if Slmgr needs to find your KMS server, it needs to ask its local DNS server to resolve an SRV record that reveals your local KMS server's host name:

```
_vlmcs._tcp.<your organization's DNS zone name>
```

For example, bigfirm.com's SRV records identifying its KMS server would be \_vlmcs.\_tcp.bigfirm.com. Sometimes, though, technical configuration problems or institutional constraints keep that SRV record out of your organization's DNS zone, and Slmgr can't activate your copy of Windows. But if you know your local KMS server's host name or IP address, you can tell your Vista or Server 2008 system to activate via that KMS server by using the command

```
slmgr -skms <server name or IP address>[:<port>]
```

So, if your KMS server is named kms1.bigfirm.com, you'd type

```
slmgr -skms kms1.bigfirm.com
```

The optional colon and port number point to the fact that activation

traffic runs over port 1688, by default; if you've reconfigured your KMS server to use another port (e.g., port 2010), you'd extend the Slmgr -skms command by suffixing a colon and that port number to the KMS server's name. For example,

```
slmgr -skms kms1.bigfirm.com:2010
```

Before you can activate a copy of Windows, you need to give it a product key. The easiest method is to make liberal use of the greatly improved setup scripts in Vista and Server 2008. But if you need to install or change a product key from the command line, the -ipk ("install product key") option can help. For example,

```
slmgr -ipk YGR45-THIS9-WONT5-0WORK-D7667
```


would enter the YGR45-THIS9-WONT5-0WORK-D7667 product key.

Have you ever needed to know whether a system license is an OEM, retail, or volume license? The Slmgr -dli command shows your Windows version (e.g., Vista Ultimate, Server Enterprise), the final five characters in your product key, the licensing state, whether you've activated, and—if not yet activated—how many *minutes* you have left. The Slmgr -dlv command also reveals that information, along with a few more activation details and several URLs to places on Microsoft's site that appear not to work anymore.

Finally, suppose you don't yet want to activate your copy of Windows for some reason. Vista gives you a 30-day grace period, and Server 2008 gives you 60 days, but both OSs also let you reset those grace periods four times, making Vista's actual grace period about 120 days and Server 2008's about 240 days. To reset it, just open an elevated command prompt and type

```
slmgr -rearm
```

### Take Control

If you're running Slmgr for the first time to do anything but activate a system, you might notice that it's slow. I suspect that the extremely complex mathematics underlying product-key and license verification add up to one of the most important weapons in Microsoft's arsenal in its war on piracy—although no one at Microsoft has ever confirmed this suspicion. Regardless, dealing with activation is no fun, but at least Slmgr lets you take greater control of it. 

InstantDoc ID 100477

**MARK MINASI** ([www.minasi.com/gethelp](http://www.minasi.com/gethelp)) is a senior contributing editor for *Windows IT Pro*, an MCSE, and the author of 25 books.



"My favorite Vista Sidebar utility is PowerShell Gadget. It's just as good as a PowerShell Here prompt."

## Windows Vista Sidebar Gadgets

Try these fun and useful additions to the side of your screen

**A**lthough I'm a bit dismayed at their insistence on taking over the right side of my screen, some of Windows Vista's gadgets for Windows Sidebar can be rather handy. Like mushrooms in the fall, gadgets are beginning to pop up everywhere, but there's only so much room in the Sidebar. To help you populate your Sidebar with only the best tools, here are my top 10 favorite Sidebar gadgets. The gadgets here (other than numbers 1 and 10) are available from Microsoft Live Gallery at [gallery.live.com](http://gallery.live.com). Just type the name of the gadget into the search box near the top of the page. Live Gallery also provides hundreds of other gadgets, so if none of these interest you, you can surely find something that does.

**10 Weather**—Yeah, it's just the weather, but it's kind of handy to have a couple of Weather gadgets for remote locations where your friends are located. On the Sidebar, the gadget shows your chosen city's name, a weather graphic, and the temperature. The Weather gadget comes with Vista and you can add it by using the Sidebar's Add Gadgets option.

**9 Auction Sidebar Tool for eBay**—If you're addicted to eBay—and who isn't?—this should be right up your alley. The gadget lets you search for and monitor auctions and place bids. It's certified by eBay, which should quell worries about a security breakdown hurting your seller or buyer rating.

**8 Wikipedia Search**—Admit it: You use Wikipedia. So do I. Wikipedia is a regular stop for research on many topics. Although it's a bit big for the sidebar, the Wikipedia Search gadget lets you quickly enter Wikipedia searches from your desktop. The Wikipedia search results are displayed in your browser window. There are two gadgets with this name on Live Gallery. I recommend the one by "fredeq."

**7 messenger**—If you use Windows Live Messenger for instant messaging, you might want to check out the messenger gadget. It shows which of your contacts are online, any alerts, and your Windows Live email status.

**6 IP Webcam Gadget**—I have a remote IP webcam in the office, and the IP Webcam Gadget gives me a handy window to the webcam right on my laptop's desktop when I'm travelling from

office to office. It took a bit of manual editing to put the address of the webcam in the included .htm file, but after that it worked well.

**5 miniIP**—The miniIP gadget gives you a quick display of your external IP information. It reports your IP address and host-name, as well as location information, including your current city and county.

**4 Vista Shutdown Control**—Vista Shutdown Control gives you a convenient way to shut down your Vista system. The gadget also has buttons that let you restart the system and lock the desktop. This gadget could be just what you're looking for if you don't like Vista's process for powering off your computer or if you often need to lock it manually.

**3 Speed Test**—Speed Test is a system performance monitor. Unlike some of the other performance gadgets out there, Speed Test displays all of its system information in a graph. The gadget can monitor a wide variety of system statistics, including CPU, RAM, and bandwidth usage; ping response time; Wi-Fi signal strength; and battery charge.

**2 ((System Monitor))**—If you're running one of today's quad-core processors, you've got to wonder exactly how much each of those cores is really being used. The ((System Monitor)) gadget gives you a quick look at your system's IP address and the status of its CPU, RAM, and battery in bar graph form. The gadget supports monitoring up to four cores.

**1 PowerShell Gadget**—My favorite Sidebar utility is PowerShell Gadget. This gadget is just as good as a "PowerShell Here" prompt—like the Command Here add-on for Windows XP. PowerShell Gadget lets you enter PowerShell commands right into the collapsed gadget. You can also expand it into a complete PowerShell console window. You can find PowerShell Gadget at [andrewpeters.net/powershell-gadget](http://andrewpeters.net/powershell-gadget).

InstantDoc ID 100422

**MICHAEL OTEY** ([mikeo@windowsitpro.com](mailto:mikeo@windowsitpro.com)) is technical director for *Windows IT Pro* and *SQL Server Magazine* and author of *Microsoft SQL Server 2008 New Features* (Osborne/McGraw-Hill).

“User dumps, when analyzed, can contain valuable clues about what caused a process crash.”



## Simplify Process Troubleshooting with DebugDiag

Find the cause of a crash, hang, or memory leak faster using this debugging tool

**W**hen troubleshooting application-stability concerns and performance problems such as crashes, hangs, and high memory usage, sometimes you need to examine the process that was active when the problem occurred. To complicate troubleshooting, server applications such as Microsoft IIS, Exchange Server, SQL Server, COM+, and BizTalk Server often display no UI and restart automatically without indicating what caused them to fail. Having the right debugging tool to isolate a problem can make finding the solution much easier. For such problems, Debug Diagnostic Tool (DebugDiag) is often a better choice than other debugging tools such as ADPlus, Userdump, and WinDbg. I'll explain why and will walk you through using DebugDiag to troubleshoot a process crash.

### Why Use DebugDiag?

To understand why DebugDiag is often a good choice for Windows process troubleshooting, let's first look at why a process might crash. A process crash is an unexpected program termination when a process exits abnormally. Typically the crash is caused by an unhandled exception; however, it could also occur when the process detects a problem condition and exits without an exception (for instance, process recycling caused by excess memory utilization).

A commonly used workaround is to restart the process or service in hopes that whatever caused the crash will no longer occur. But to really determine what caused the problem and to fix it, you must analyze the process state at the time of failure. You could capture a process's state at any time by generating a user dump file. User dumps are generated by any Windows debugger and have the file extension .dmp, .hdmp, or .mdmp. The main Windows debuggers for processes are WinDbg, Cdb, and ntsd, and their user dumps, when analyzed, can contain valuable clues about what caused a process crash. Accurately analyzing a process dump file can require some expertise. That's where DebugDiag comes in: It makes the analysis portion of the troubleshooting process much simpler.

DebugDiag combines many key features from each of the Windows Debugging Tools (ADPlus, Userdump, and WinDbg) and includes a rich UI, which helps make the tool easy to use. You can download the latest version of DebugDiag at [www.microsoft.com/downloads/details.aspx?familyid=28bd5941-c458-46f1-b24d-f60151d875a3](http://www.microsoft.com/downloads/details.aspx?familyid=28bd5941-c458-46f1-b24d-f60151d875a3). DebugDiag is installed as a service, so configuration settings that you set in DebugDiag will survive system reboots. The tool's

analysis feature is fast, easy to use, and portable, so you can send the data to a manufacturer or in-house developer for further review and troubleshooting. DebugDiag requires less than 19MB of disk space. It runs on Windows Vista/XP/2000/NT and Windows Server 2003 but hasn't been tested on Windows Server 2008.

### DebugDiag in Action

Let's look at how the Microsoft Global Escalation Services team used DebugDiag to handle a recent customer issue. The customer's website kept going down, and we suspected that the Microsoft World Wide Web server process might be crashing. So we installed DebugDiag and configured it to monitor specifically for crashes in the World Wide Web Publishing Service.

After you install and start DebugDiag, you're immediately presented with the Select Rule Type wizard dialog box, which lets you choose the appropriate rule to use, depending on what you want to monitor. In this example, we'll concentrate on process crashes, so if you suspect or have confirmed that a process crash is occurring, you should select the Crash rule type in the Select Rule Type dialog box, then click Next.

Now you'll choose the type of process to monitor in the Select Target Type dialog box, such as a specific NT service, a specific process (e.g., an application process), or all IIS/COM+ related processes. For our customer support problem, we chose to monitor a specific service and selected the World Wide Web Publishing Service in the Select Target dialog box.

In the wizard's next dialog box, Advanced Configuration (Optional), you can configure optional advanced settings for crash monitoring. In our case, we simply chose the defaults and clicked Next. You'll then see a dialog box showing the name of the rule and the path in which the user dump data will be stored; click Next to keep the defaults or make changes, such as changing the default directory where dump files are stored.

You'll see the final dialog box, where you can either activate the rule now or manually activate it later. Then click Finish. Note that you might want to choose the *activate later* option if you aren't ready to monitor a process just then but want to complete the configuration steps ahead of time.

Now you'll see the main DebugDiag application window, which has three tabs. Click the Rules tab to see the configured rules on that system, the rule name, the rule's status (active or not), and Userdump Count. Userdump Count is the number of process crashes for the



## WHAT WOULD MICROSOFT SUPPORT DO?

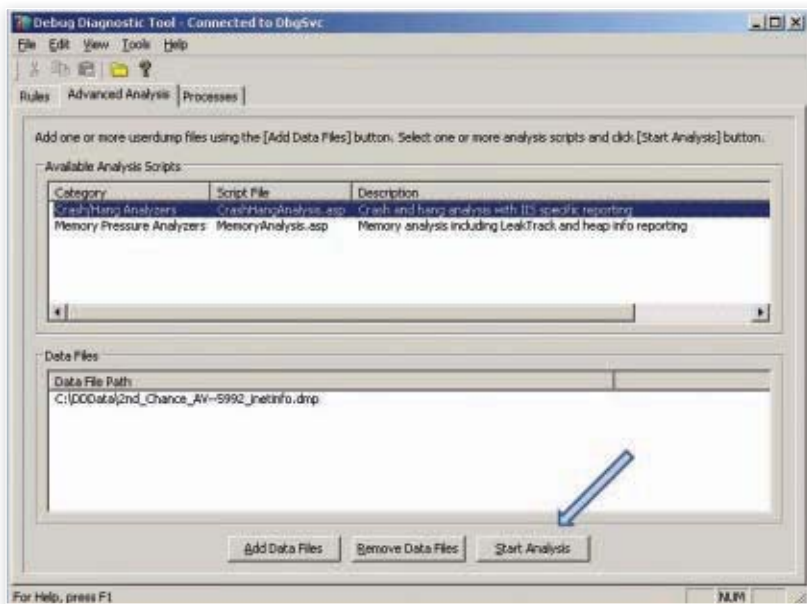


Figure 1: Selecting a script to analyze user dump data

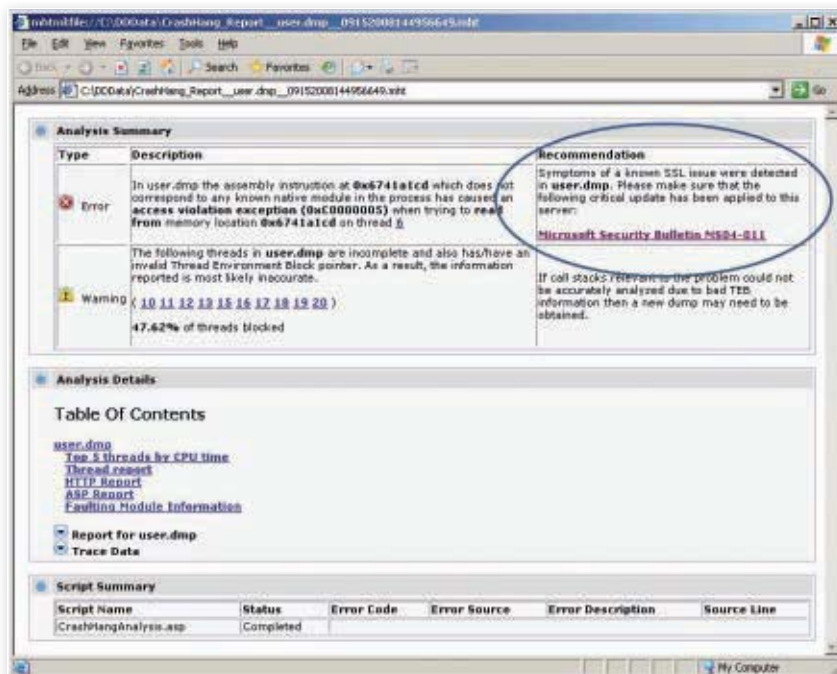


Figure 2: Analysis report recommendations

monitored process that DebugDiag captured and stored in the path listed under the Userdump Path column. The Processes Tab displays the currently running processes on the system.

### Analyzing the Data

After you've configured DebugDiag to monitor for a specific process, you can reboot the system and log off without worrying about disturbing the monitoring process. When you suspect the monitored process

has crashed, you can check the DebugDiag application window and view the Userdump Count column to verify that a user dump file has been created.

The Advanced Analysis tab, which Figure 1 shows, is where you select which script you want to run to analyze the user dump data for a monitored process. We chose the Crash/Hang Analyzers script since we want to analyze a process crash. Next, you'll need to add a user dump file to analyze, by clicking the Add Data Files button and navigating

to the stored location of the captured user dumps. Highlight the appropriate .dmp file and click the Open button. You'll see that the dump file has been added; you're now ready to start the analysis.

Click the Start Analysis button to execute the script you selected. DebugDiag will show the analysis progress. When the analysis is finished, DebugDiag automatically saves the analysis report in the DebugDiag\Reports folder and opens it in Internet Explorer. An analysis report has three main sections:

- Analysis summary—an Event Viewer-type of message that records errors, warnings, and information relevant to the user dump analysis along with descriptions and recommendations for solving the problem shown by the error and warning information.
- Analysis details—starts with a table of contents listing all the analyzed memory dumps. For each memory dump, there's a listing of report titles indicating the type of analysis performed.
- Script summary—reports the status of the script that was run to analyze the user dump. If any errors occurred while the script ran, this section will list the error code, source, description, and lines that caused the errors.

For the World Wide Web Publishing Service crash, we found the resolution in the analysis summary's Recommendation section, which provided a link to a Microsoft article that contained the fix for the problem, as Figure 2 shows.

### Closing in on a Solution

Although DebugDiag probably won't resolve every Windows process problem, it will usually provide data to move you closer to a solution. Sometimes you might get only the .dll name and manufacturer that caused the problem, but with such data you can search online for a solution or help your tech support person more quickly resolve the problem.

InstantDoc ID 100577

**MICHAEL MORALES** (morales@microsoft.com) is a senior escalation engineer for Microsoft's Global Escalation Services team. He specializes in advanced Windows debugging and performance-related issues. For information about Windows debugging, visit [blogs.msdn.com/ntdebugging](http://blogs.msdn.com/ntdebugging).

# Virtualization is only half the battle for efficiency.

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DATA CENTRES ON DEMAND



## Principles of InfraStruXure® High Density-Ready Architecture...

- 1 Rack enclosures that are HD-Ready
- 2 Metered PDUs at the rack level
- 3 Temperature monitoring in the racks
- 4 Centralized monitoring software (not shown)
- 5 Operations software with predictive capacity management (not shown)
- 6 Efficient InRow® cooling technology
- 7 UPS power that is flexible and scalable

## Virtualization is here to stay.

And it's no wonder – it saves space and energy while letting you maximize your IT resources. But smaller footprints can come at a cost. Virtualized servers, even at 50% capacity, require special attention to cooling, no matter their size or their location.

- 1. Heat** Server consolidation creates higher densities – and higher heat – per rack, risking downtime and failure.
- 2. Inefficiency** Perimeter cooling can't reach heat deep in the racks. And over-cooling is expensive and ineffective.
- 3. Power Events** Virtual loads move constantly, making it hard to predict available power and cooling, risking damage to your network.

## The right-sized way to virtualize.

With the new HD-Ready InfraStruXure architecture, you can take on high-density by cooling the virtualized high-density row, controlling power at the rack level, and managing the system with advanced software and simulation. Though virtualizing saves energy, true efficiency also depends on the relative efficiencies of power, cooling, and servers. Right-sizing one and not the others (See Figure 1) leaves efficiency savings on the table. To right-size, depend on the efficient, modular HD-Ready InfraStruXure and neutralize heat at the source. Equipment will be safer and more efficient running closer to 100% capacity.

## Don't agonize, virtualize.

What are you waiting for? With HD-Ready InfraStruXure architecture anyone can virtualize... anytime, anywhere. Just drop it in and go.

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### SCHEMATIC LEGEND:

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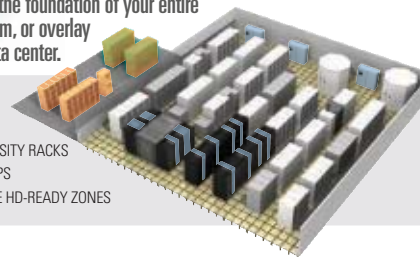


Figure 1

## Efficiency and Virtualization

Your servers are efficient, but is your power and cooling?

- COOLING USAGE/CAPACITY
- SERVERS
- POWER USAGE/CAPACITY

### Pre-Server Virtualization

Big gains can be made with both server and power and cooling.

- ☐ Correct Server Utilization
- ☐ Correct-sized Power
- ☐ Correct-sized Cooling



### Post-Server Virtualization

Grossly oversized power and cooling cancels out potential gains made by virtualizing.

- ☒ Correct Server Utilization
- ☐ Correct-sized Power
- ☐ Correct-sized Cooling



### Server Virtualization with Power and Cooling

Right-sized power and cooling tip the balance back in your favor.

- ☒ Correct Server Utilization
- ☒ Correct-sized Power
- ☒ Correct-sized Cooling



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## TOOL TIME

windowsitpro.com

## InstallWatch Keeps Track of Installation Changes

A colleague, Gil Cintron, recently recommended that I try Epsilon Squared's InstallWatch. This free tool scans your PC before and after an application's installation and shows you all the changes (e.g., registry key changes, file changes, version updates) that were made. When I asked Gil if he had an example of how InstallWatch made his job easier, he had this to say, "I worked in a lab where we tested applications for approval to be included as part of the Navy's Integrated Shipboard Network System (ISNS) baseline. Before an application can be accepted, it has to meet compatibility and security requirements. InstallWatch was one of the main tools we used to keep track of exactly what each program was trying to do with our systems. When dealing with defense and tactical systems, there isn't any room for guesswork. InstallWatch did a pretty good job of eliminating the guesswork."

To test InstallWatch's functionality, I downloaded it from [www.epsilon-squared.com](http://www.epsilon-squared.com) and installed it on my PC. As instructed, I used InstallWatch to take an initial scan of my PC. I then installed an application I had lying around. Finally, I used InstallWatch to take another scan. Both scans were extremely fast, even on my virtual machine. InstallWatch then produced a report showing which files and registry keys had been added, deleted, or modified. The InstallWatch reports are stored on the local hard drive and can be exported to an HTML or text file for later review.

If you add InstallWatch to the Startup folder, it can run by itself in the background. According to the tool's Help file, InstallWatch will monitor your system and make its presence known whenever an application begins an installation routine.

I found InstallWatch to be extremely simple to use. It also works as promised. Great find, Gil!

—Eric B. Rux, senior Windows administrator and cofounder of WHSHelp.com

InstantDoc ID 100463



## ■ InstallWatch

## ■ Holiday HTA

## READER TO READER

## Happy Holidays HTA

Once in awhile it's fun to do something a little different with scripting. For example, I created a HTML Application (HTA) that's a greeting card for the holiday season. HolidayTree.hta uses basic timers with randomized colors to produce a colorful holiday tree with blinking multicolored lights and a Happy Holidays greeting (see Figure 1). You can find HolidayTree.hta in the 100488.zip file, which you can access by going to [www.windowsitpro.com](http://www.windowsitpro.com), entering 100488 in the InstantDoc ID box, clicking Go, then clicking the *Download the Code Here* button. To "open" the card, simply double-click the HolidayTree.hta file.

If desired, you can easily personalize the greeting and change the color of the tree lights and the background. To change the greeting, open the file in Notepad and find the code

```
<p align="center"><b>
  <font size="7" color="#800000">
    <span style="font-family: Brush
      Script MT"> Happy Holidays</span>
  </font></b></p>
```

Replace *Happy Holidays* with your greeting.

To change the color of the tree lights or background, you need hexadecimal color codes. I included the AddColor.hta in the 100488.zip file for this purpose. In the AddColor.hta's UI, click the Rainbow Chart button to create a red-green-blue (RGB) color chart in Microsoft Word. This chart consists of 180 different colored cells. Inside each cell is the RGB value that creates the color. After you find the color you want, you can convert the RGB number into the hex code in AddColor.hta. (If you'd like more

information about AddColor.hta, see the VIP exclusive article "Add a Little Color to Your World" at [windowsitpro.com/article/articleid/47800/add-a-little-color-to-your-world.html](http://windowsitpro.com/article/articleid/47800/add-a-little-color-to-your-world.html).)

After you have the hex codes for the colors you want to use, plug your hex color codes into HolidayTree.hta. The code

```
<body bgcolor="#008080">
```

sets the background color. The code

```
str = "#FF0000,#FFFF00,#FF00FF," & _
  "#00FF00,#00FFFF,#0000FF,#ADFF2F"
str = str &
  ",#FF8C00,#FF1493,#FFCC00," & _
  "#FFEEF5,#8B008B"
```

sets the color of the tree lights. Happy holidays to you all!

—Jim Turner, domain administrator and applications developer, Computer Sciences Corp.

InstantDoc ID 100488



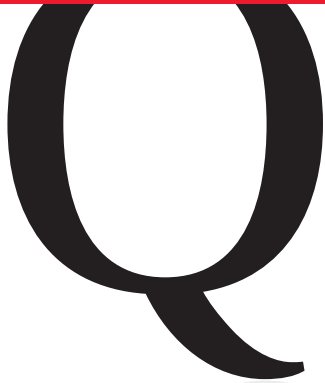
Figure 1: An HTA holiday card

Tell the IT community about the free tools you use, your solutions to problems, or the discoveries you've made. Email your contributions to [r2r@windowsitpro.com](mailto:r2r@windowsitpro.com).

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## ANSWERS TO YOUR QUESTIONS



**Q:** What is the Security Center Control Panel applet in Windows Vista and Windows XP SP2 used for? Is there a way to modify how Security Center notifies users of security-related problems?

**A:** Security Center is a Control Panel applet that Microsoft introduced in XP SP2 that provides a central configuration and management interface for client-side security services. Security Center continuously monitors the status of client-side security services. In XP SP2, Security Center monitors Windows Firewall, virus protection, and Automatic Updates settings. Vista's Security Center also monitors Windows Defender, Microsoft Internet Explorer (IE) security, and User Account Control (UAC) settings.

Behind Security Center is an engine that continuously monitors the configuration status of these security services and informs users of their status. Each service's status is checked against the preferred configuration settings that are specified in the Security Center configuration dialog box, which Figure 1 shows. For example, the Security Center verifies that Windows Firewall, Automatic

Updates, and real-time virus scanning are enabled and that the virus protection signature files are up-to-date. If Security Center finds that a service isn't operating as specified in the Security Center configuration dialog box, it alerts the user by displaying a red icon in the user's taskbar or displays an alert message on the user's desktop. Users can modify the way Security Center notifies them of problems by clicking the *Change the way Security Center alerts me* link that's located in the left pane of the Security Center dialog box. From the resulting Windows Security Center dialog box, users can disable the Security Center notifications, enable only user taskbar notifications, or enable only notification messages on the user's desktop.

Security Center is enabled by default on Vista and XP SP2 systems that aren't joined to a Windows domain. For domain-joined machines, administrators can enable and disable Security Center via the *Turn on Security Center (Domain PCs only)* Group Policy Object (GPO) setting that's located in the Computer Configuration\Administrative Templates\Windows Components\Security Center GPO container. ♦

—Jan DeClercq  
InstantDocC ID 100194



Figure 1: The Security Center configuration dialog box



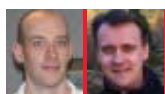
**Q:** Should I install a System Center Data Protection Manager (DPM) 2007 agent on my guest OS virtual server?

**A:** It depends on what you want to protect. If you install a DPM agent on the virtual server's main DPM 2007 administrator console, you can protect only virtual machines (VMs)—you can't protect any applications run by the VMs. If you deploy the agent in the guest OS, you can protect everything the VM runs. For example, if the VM runs Microsoft SQL Server, you can protect the databases and capture the transaction log data.

There are also licensing considerations. If you deploy the DPM agent in the guest OSs, they each need an agent license.

This doesn't mean that protection at the virtual-server level is inconsistent. Virtual Server 2005 R2 SP1 has a recursive Volume Shadow Copy Service (VSS) writer, so when DPM 2007 asks the virtual server for a snapshot, the request is passed to all VM VSS writers and you get a consistent data backup.

—John Savill  
InstantDocC ID 100193



jsavill@windowsitpro.com  
jan.declercq@hp.com

# Virtualization REMATCH

We put the latest incarnations of Microsoft Hyper-V and VMware ESX Server to the test by Michael Otey

**E**arlier this year, *Windows IT Pro* published my head-to-head comparison of Microsoft's Hyper-V virtualization platform and VMware's market-leading ESX Server. (See the Learning Path, page 23.) In that two-part series, I compared the feature sets, licensing, and performance of both products. I found ESX Server to have a notably better installation and management story, as well as a slight performance edge. However, for a pre-release product, Hyper-V fared well and proved itself to be a viable virtualization platform.

Since that first round of reviews, much has changed in the virtualization market. First, the RTM version of Hyper-V is now available: Microsoft has made its final performance enhancements to the product. Second, Microsoft has released a standalone version of Hyper-V called Hyper-V Server 2008. For more information about this incarnation, see the web-exclusive sidebar "The Standalone Hyper-V Server 2008" ([www.windowsitpro.com](http://www.windowsitpro.com), InstantDoc ID 100574). Third, both companies have altered the licensing for their respective products. Hyper-V Server 2008 and VMware ESXi are free downloads. For more information about VMware ESXi, see the web-exclusive sidebar "ESXi vs. ESX Server" (InstantDoc ID 100575).

Considering these changes, I've decided to retest these products' management and performance aspects, as well as address some particular concerns about each product that readers—and Microsoft and VMware representatives—have brought up since my first tests. Now, let's jump back into the ring with ESX Server and Hyper-V.

## Hypervisor Differentiation

Both ESX Server and Hyper-V are hypervisor-based, but not all hypervisors are created equal. The architectures of these products differ significantly. And many IT pros have been confused by Hyper-V, mistakenly assuming that because it's shipped with Windows Server 2008, it's a hosted virtualization product that runs on top of the Server 2008 OS. That's not the case. Like ESX Server, hypervisor-based Hyper-V runs directly on the system hardware.

Figure 1 provides an architecture comparison. As you can see, one of the biggest differences between the products is the way each handles hardware device drivers. ESX Server implements the drivers as a part of

the hypervisor itself—a method that results in a comparatively large hypervisor. This approach also adds third-party code to the hypervisor. VMware tests and certifies these drivers, but they're developed by system hardware vendors. (For a list of systems that support ESX Server 3.5 and ESXi, see the Learning Path.) Hyper-V implements the drivers in the parent partition, outside the hypervisor. Table 1, page 22, provides the pros and cons of each approach.

The implementations of the hypervisor itself also differ. The ESX Server hypervisor uses a 32-bit kernel, allowing it to run on both 32-bit and 64-bit systems. However, that doesn't limit it to running only 32-bit guests; ESX Server also supports 64-bit guests if it's running on a 64-bit hardware platform. With its next ESX Server release, VMware plans to move to a 64-bit hypervisor. By contrast, Hyper-V already uses a 64-bit hypervisor, which promises improved performance and scalability. Also, Hyper-V requires that the system you install it on possess processor-assisted virtualization (e.g., AMD processors that support AMD-V, Intel processors that support Intel-VT). Hyper-V requires that the processor have either AMD's No Execute (NX) or Intel's Execute Disable (XD) features, and the system needs to offer BIOS support for virtualization. These features are standard in most of today's server systems, but they aren't in all systems.

## Guest Support

To some extent, the differences between the products' hypervisor implementations are academic. Both products have proven to be good performers and scale well with multiple workloads. However, the difference in guest OS support is much clearer. In this respect,

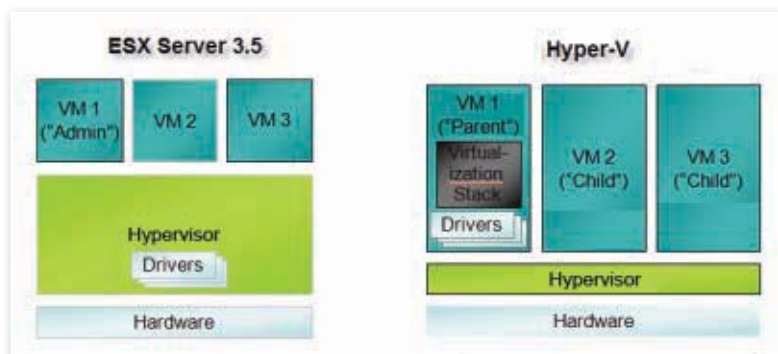


Figure 1: Comparing the Hyper-V and ESX Server architectures



## VIRTUALIZATION REMATCH

ESX Server is a much more mature product: VMware supports a wide array of guest OSs. Web Table 1 (InstantDoc ID 100573) provides a list of guest OSs that ESX Server supports. (For a complete list of the guest OSs that the product supports, see the Learning Path.)

As you might expect, the list of guest OSs that Hyper-V supports includes all the recent Microsoft OSs but few others. Web Table 2 provides a list of guest OSs that Hyper-V supports. (For a complete list of the guest OSs that the product supports, see the Learning Path.) The list of OSs that Hyper-V supports is dominated by Microsoft, with the exception of SUSE Linux—but this Linux implementation is limited to a single virtual CPU, far short of the Linux support that ESX Server offers. Microsoft marketing states that Hyper-V runs other OSs, such as multiple Linux distributions, but actually Hyper-V doesn't support any distribution other than SUSE, for which Microsoft has an agreement with Novell. Microsoft has made the code for the Linux Hyper-V integration components available but has left its adoption to other vendors—a significant development because the VMBus-aware drivers that provide the best Hyper-V performance are installed as a part of the integration components. Without them, the guest must run in slower legacy-emulation mode. Currently, no integration components are available for other Linux implementations, but you can run other Linux distributions as unsupported legacy guests.

### Built-In Management

This review is focused solely on the virtualization platforms themselves, and I won't touch on the management suites that either vendor provides as separate products. The distinction can be confusing: Many VMware-supporting readers have opined that VMware's VMotion is the single biggest difference between the products; however, although VMotion is an important feature, it's not a part of ESX Server but rather a component of the VMware Infrastructure 3 (VI3) management suite. A forthcoming *Windows IT Pro* article will compare VI3 and Microsoft's management suite, System Center Virtual Machine Manager (SCVMM). Let's take a look at the products' inherent management functionality.

**ESX Server.** You use the Virtual Infrastructure Client to manage ESX Server. To

Table 1: Pros and Cons of ESX Server and Hyper-V's Driver Implementation

Hypervisor Architecture	Pros	Cons
VMware's Approach (Drivers in Hypervisor)	Better control of resources used by device drivers	Third-party code in hypervisor
	Drivers optimized and tested for virtualization	Larger hypervisor
	All VMs operate independently	Smaller range of supported hardware
Microsoft's Approach (Drivers in Parent Partition)	No third-party code in the hypervisor	Uses standard device drivers
	Smaller hypervisor	Failure in the parent partition could affect all VMs
	Wide range of supported devices	

download the client to your local system, you simply point your web browser to your ESX Server system, then click the Download VMware Infrastructure Client link. The entire process takes a couple minutes. The Virtual Infrastructure Client offers a full-featured, functional interface for managing multiple VMware virtual machines (VMs) for one ESX Server host. You can create and control VMs, and you can control a number of host settings, such as the configuration of virtual switches, the host time, the DNS server, and VMs' automatic start and stop actions. Also, you can use the Virtual Infrastructure Client to set up users and groups, along with their associated permissions.

The most noticeable missing feature is the ability to easily copy VMs among hosts. There's no built-in Windows Explorer, and no connections to remote hosts. However, free third-party tools such as Veeam ([www.veeam.com](http://www.veeam.com)) and WinSCP ([www.winscp.net](http://www.winscp.net)) can fill this gap. One of the best features of the client is its ability to track performance data at both the host and the VM level. It provides a storage summary, as well as CPU, memory, network, and disk usage. Figure 2 shows the Virtual Infrastructure Client's Performance tab.

Although the Virtual Infrastructure Client provides a good management interface in the absence of the VI3 management suite, it's limited. For example, it doesn't provide



Figure 2: Virtual Infrastructure Client

the ability to import and convert VMs, as the other VMware virtualization products do. And it doesn't let you copy or clone VMs. These options are present only if VI3 and VirtualCenter Server are available. Finally, I've found that I often need to drop back into the Linux management console to perform many tasks. For example, if I copy a VM to ESX Server, I don't get a graphical option to register the VM—I need to use the `Vmware-cmd` command.

**Hyper-V.** In the arena of management, Hyper-V stumbles. Management for Hyper-V with a full Server 2008 installation is a good experience: When you install the Hyper-V role, the Hyper-V Manager is present and you can use it from the full Server 2008 installation to manage Hyper-V. Such is not the case for the Server Core version. Server Core has no built-in GUI and requires remote management. However, unlike ESX Server, the remote client is a separate download, and I had difficulty getting it connected. I used Server 2008 and a Vista client. I first tried it in a workgroup, then in a domain. Although it eventually worked, it wasn't a good experience—certainly not on par with the easy

## Learning Path

### WINDOWS IT PRO RESOURCES

"A First Look at Windows Server 2008 Hyper-V,"  
InstantDoc ID 97857

"A Long, Hard Look at Hyper-V," InstantDoc ID 100437

"Hyper-V FAQs," InstantDoc ID 99440

"Virtualization Shootout, Part 2," InstantDoc ID 99248

"Virtualization Shootout, Part 1," InstantDoc ID 98879

### OTHER RESOURCES

Systems Compatibility Guide for ESX Server 3.5 and  
ESX Server 3i

[www.vmware.com/pdf/vi35\\_systems\\_guide.pdf](http://www.vmware.com/pdf/vi35_systems_guide.pdf)

VMware Guest Operating System Installation Guide

[www.vmware.com/pdf/GuestOS\\_guide.pdf](http://www.vmware.com/pdf/GuestOS_guide.pdf)

Virtualization with Hyper-V: Supported Guest  
Operating Systems

[www.microsoft.com/windowsserver2008/en/us/hyperv-supported-guest-os.aspx](http://www.microsoft.com/windowsserver2008/en/us/hyperv-supported-guest-os.aspx)

Virtual Infrastructure Client installation and connection. During my first round of testing, I attributed the difficulty to Hyper-V's pre-release code. Unfortunately, I was dismayed to find that the problem remains unresolved in the final release version.

The core of the problem seems to be that the Hyper-V Manager doesn't provide a mechanism for passing authentication information to the Hyper-V host. This omission requires you to embark on a painstaking multistep manual process to configure the client—and the server—that you want to use. You have to repeat the process for all the clients that you want to use to remotely manage Hyper-V. Adding insult to injury, the

steps aren't documented with the product; you need to search Microsoft's blogs to find them. This situation represents a big hurdle to running Hyper-V on Server Core—particularly for SMBs looking to get started with virtualization. Until this problem is resolved, if you want to run Hyper-V, I'd go with the full Hyper-V and Server 2008 installation.

Personally, I'm surprised Microsoft didn't do a better job with this aspect. After all, running Hyper-V on Server Core lets you have less overhead and a more secure implementation. Plus, VMware has already shown how to do it correctly. All that being said, using the full Server 2008 installation has little effect on performance but makes the management of Hyper-V much easier.

The Hyper-V Manager provides a basic management interface that lets you manage a VM on one or more Hyper-V servers. You can create VMs and control them, create VLANs through the new virtual switching feature, set up automatic VM start and stop attributes, and set VM resource allocations. The Hyper-V Manager is functional but doesn't provide any of the advanced features (e.g., performance monitoring) that the Virtual Infrastructure Client provides. Figure 3 shows the Hyper-V Manager's Resource Allocation dialog box. Web Table 3 provides a summary of the management features that each product provides.

### Performance Testing

I ran two sets of tests on an HP ProLiant ML370 G4, with two Intel quad-core Xeon processors running at 1.86GHz on a 1066MHz frontside bus. The system comes with 8GB of RAM and eight 72GB 15,000rpm drives configured as a RAID array. My tests in the previous articles were based on timed Windows Shell scripts. For this set of follow-up tests, I converted my test scripts to PowerShell, which enabled better program control as well as the ability to use ADO.NET as

my SQL Server data-access mechanism.

**The first set.** First, I repeated the set of tests that I ran in the original articles. During those first tests, Hyper-V was in a pre-release state. For the final version, Microsoft has added some performance tweaks to the release code. To simulate a production server-consolidation scenario, I set up eight VMs on the host (each configured with 512MB of RAM) and I used the default settings for new virtual hard drive configuration. I used external networking, which linked the VMs' virtual network adaptors to the host. For this first round of tests, all the VMs were configured with the 64-bit Server 2008 Enterprise Edition. For the Hyper-V portion of the tests, the integration components were loaded onto all the guests. And yes, the Hyper-V VMs were all using the high-performance VMBus device drivers. For the ESX Server tests, the VMware Tools were installed.

To create a mixed workload, I configured six of the VMs to function as file servers and two as database servers running Microsoft SQL Server 2005 Enterprise Edition SP2. To test the file-server performance, I used a routine that copied a set of 10 files (totaling about 130MB) from the file server to the local client's hard disk. Then, the routine copied the files back to another directory on the server and deleted them. I used a three-second think time between all the operations. This routine repeated 20 times.

To test the SQL Server workload, I used 27 queries running against the sample AdventureWorks database. Although the bulk of the workload was data retrieval, the batch also contained a couple CPU-intensive queries, a 5,000-row insert function, and four SELECT INTO statements to add some data-modification operations. I inserted a three-second think time between each database interaction.

As you can see in Figure 4, page 24, ESX Server and Hyper-V provided similar performance under these test conditions. The bars in the graph indicate the total average time to complete the test suite. ESX Server demonstrated a 4 percent edge over Hyper-V in the test's file-server portion. However, Hyper-V beat ESX Server in the database testing by 1 percent. The combined results were the totals for both the file-server and database tests. This set of tests ran for about 20 minutes. Overall, ESX Server won the combined results by providing 3 percent

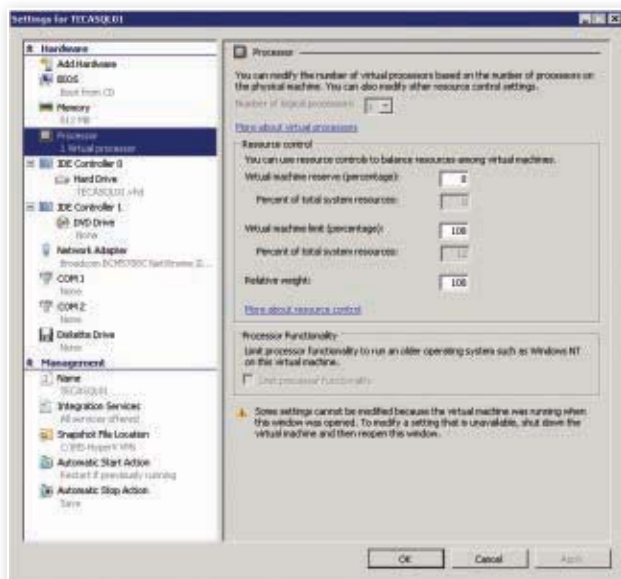


Figure 3: Hyper-V Manager

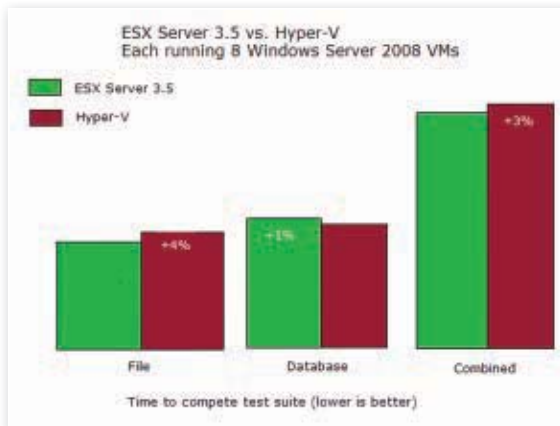


Figure 4: Performance Testing Round 1

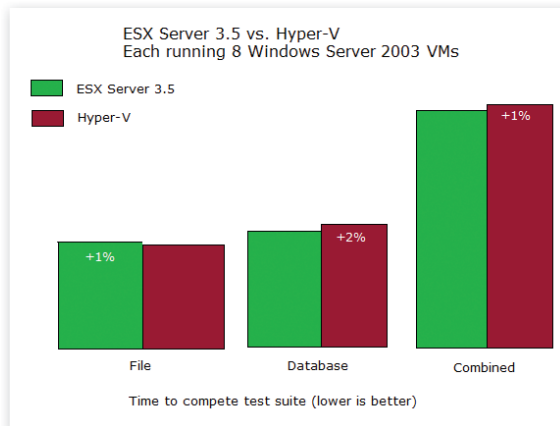


Figure 5: Performance Testing Round 2

better performance than Hyper-V. Although ESX Server finished the test suites faster than Hyper-V, the 3 percent difference is small.

**The second set.** One reader comment about my first round of testing was that Server 2008 is optimized to run under Hyper-V and that other OSs might not deliver the same levels of performance. Microsoft confirmed this optimization and explained that certain guest OSs (e.g., Server 2008) are considered *enlightened*. Further, there are two types of guest enlightenment. The first is a basic level of *driver enlightenment*, which means that the guest OS can take advantage of Hyper-V's high-performance VMBus architecture. Vista and Server 2008 possess a second level of enlightenment called *kernel enlightenment*. Kernel enlightenments improve processor and memory performance to further optimize the guest OS for running in a VM. For more information about the Hyper-V architecture, see the Learning Path.

To determine whether Server 2008 offered any advantages while running under Hyper-V, I re-ran a second set of tests, following the same pattern as the tests

in the first set. However, the second test set used 32-bit Windows Server 2003 Enterprise Edition SP2 as the guest OS for all the VMs. Again, for Hyper-V, the integration components were loaded and the VMs were using the VMBus drivers. For ESX Server, the VMware Tools were installed.

As you can see in Figure 5, the results were even closer than the first set of tests. In a surprise turnabout, Hyper-V posted a 1 percent edge over ESX Server in the file-server portion of the tests, whereas ESX Server posted a 2 percent advantage over Hyper-V in the database tests. Overall, ESX Server held a slight 1 percent edge in the combined performance results. Considering that the results with Windows 2003 were even closer than the results with

Server 2008, it's fair to conclude that under these test conditions, Server 2008 showed no significant performance benefit by running under Hyper-V as opposed to ESX Server.

At this scalability level, ESX Server had a slight lead in both the 64-bit and 32-bit tests, but it's clear that both virtualization platforms deliver close levels of performance. That said, ESX Server's support for larger system configurations enable it to have greater overall scalability than Hyper-V.

## Virtual Reality Check

Both products deliver excellent virtualization performance, but Hyper-V is hamstrung by substandard remote management and limited support for non-Microsoft guest OSs. VMware's superior remote management and broader guest support characterize the more mature ESX Server.

At this point, for midsized-to-large business and enterprises, the more manageable ESX Server is the better choice, particularly if you want to support a mix of Windows and Linux guests. Remote management for Hyper-V is still too problematic. However,

Hyper-V is a good choice for smaller businesses running Server 2008 that primarily want to virtualize Windows servers. The product's inclusion with Windows makes it simpler to use and adopt: You don't need to learn the unfamiliar commands necessary to deal with ESX Server's Linux-based management console. However, because of the aforementioned remote-management difficulties, I can't recommend Hyper-V on Server Core at this time. That being said, running Hyper-V on a full Server 2008 installation works well.

Virtualization is fast becoming an important business commodity, with both Microsoft and VMware essentially providing free virtualization products. However, raw virtualization is only half the story. The other half is management—which is where both vendors are looking to make their money. VMware's VI3 management suite has a big head start in this area, but Microsoft's SCVMM, with its ties to the System Center family of products, offers unique advantages. An upcoming issue of *Windows IT Pro* will compare Microsoft's and VMware's virtualization-management suites.

InstantDoc ID 100573

## Hyper-V

**PROS:** Very good performance; great value

**CONS:** Poor remote-management experience; needs a better management console

**RATING:** ◆◆◆◆◆

**RECOMMENDATION:** Recommended for small businesses planning to adopt Windows Server 2008.

**CONTACT:** Microsoft • [www.microsoft.com](http://www.microsoft.com)

## ESX Server 3.5

**PROS:** Excellent performance; easy installation; polished management console

**CONS:** Somewhat limited hardware support

**RATING:** ◆◆◆◆◆

**RECOMMENDATION:** Recommended for midsized-to-large businesses looking for performance and manageability.

**CONTACT:** VMware • 877-486-9273 • [www.vmware.com](http://www.vmware.com)



### Michael Otey

(mikeo@windowsitpro.com) is technical director for *Windows IT Pro* and *SQL Server Magazine* and author of *Microsoft SQL Server 2008 New Features* (Osborne/McGraw-Hill).





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# Using WDS with WINDOWS SERVER 2008

**W**indows Deployment Services (WDS) is Microsoft's newest image deployment product, designed to deploy Windows Vista and Windows Server 2008. (WDS also supports Windows XP and Windows Server 2003, but you'll need to do a fair amount of tweaking.) You could call WDS the new Remote Installation Service (RIS). But wait—even if you took a look at RIS and went directly back to other imaging technologies, take a good look at WDS—it's worth it. WDS is more streamlined and easier to use than RIS ever dreamed of being. This article is a step-by-step guide for you to get WDS up and running in your environment in less than an hour.

## Installing and Configuring WDS

First let's look at how WDS works. Clients receive IP information from a DHCP server during the boot sequence. Next, the WDS client finds the WDS server via broadcasting or DHCP, then connects to the WDS server and boots a special boot image called a Windows Preinstallation Environment (WinPE). Finally an OS image stored on the WDS server is installed on the client.

The WDS role ships with Server 2008 and requires three additional roles: DNS to find domain controllers (DCs); Active Directory (AD), either 2003 or 2008, for authentication; and DHCP for IP address information and options such as the IP address of the WDS server. The server on which you install WDS must be an AD member. All four roles (AD, DNS, DHCP, and WDS) can be installed on the same server, or you can separate the roles.

To install WDS on Server 2008, open Server Manager, highlight Roles, then click Add Roles (top right corner). The Add Roles Wizard launches and displays the Before You Begin page. Click Next. From the list of roles displayed, scroll down and select Windows Deployment Services. Click Next three times, accepting the defaults on each page (Overview of WDS, Select Role Services, Confirm Installation Selections). Click the Install button. When the installation is complete, click Close and you're ready to configure your new WDS server—no reboot needed.

Configure WDS by opening the WDS snap-in found under Start, Administrative Tools, Windows Deployment Services, or in Server Manager. (Although you might need to close and reopen Server Manager to see the new snap-in.) Expand Servers; there should be a yellow yield sign next to your server's name. Right-click your server name and choose Configure Server. The Welcome Page lists WDS's requirements; click Next.

Microsoft's newest image deployment technology eases the task of rolling out your OS

by Rhonda Layfield





On the Remote Installation Folder Location page, choose the drive on which you want to store your images and click Next. The drive you store the images on should be dedicated to image storage because of the amount of space that will be needed. The next page to be displayed is determined by whether DHCP is installed on the WDS server or not. If (and only if) DHCP is installed on the same server as WDS, you'll get the DHCP Option 60 page. To learn more about DHCP Option 60 and the relationship between DHCP and WDS, see the web-exclusive sidebar "Configuring DHCP and WDS," [www.windowsitpro.com](http://www.windowsitpro.com), InstantDoc ID 100440.

The next page, PXE Server Initial Setting, lets you set whether you want the WDS server to respond to Preboot Execution Environment (PXE) client requests, and if so, how. You'll see four options:

1. Do not respond to any client computer. This turns off WDS responses.
2. Respond only to known client computers. WDS will respond to clients that have been pre-staged in AD. Pre-staging is done in Active Directory Users and Computers just as it was done in RIS.
3. Respond to all (known and unknown) client computers. By itself, this option would cause WDS to respond to all PXE requests; if you select this option and also select option 4, your setup is a bit more secure.
4. For unknown clients, notify administrator and respond after approval. This option allows pre-staged machines to receive a response from the WDS server, but unknown clients would remain on the PXE boot screen until an administrator has approved the request within the WDS snap-in. To approve a request from an unknown client, you would open the WDS snap-in, expand Servers, and highlight Pending Devices. In the results pane, you'll see a pending request. Right-click the pending request and choose either Approve, Reject, or Approve and Name. The first two choices are straightforward; the third option approves the request and names the computer object that will be created in Active Directory Users and Computers.

Select the appropriate option, and click Finish. On the Configuration Complete

page, clear the *Add images to the Windows Deployment Server* now check box (because you have no image to add yet) and click Finish.

### Adding an Image

There are two types of Windows Imaging Format (.wim) images you can add to WDS servers: boot and OS images. First I'll show you how to add a boot image. After we create an OS image, I'll explain how

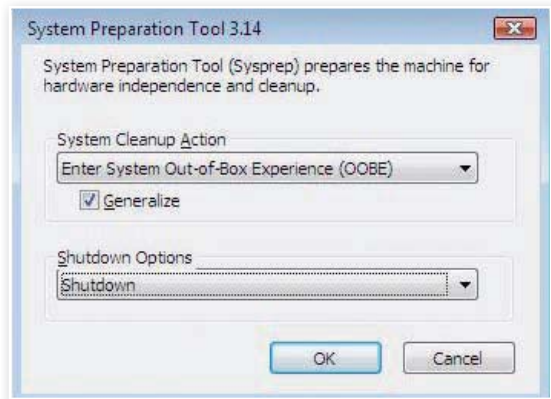


Figure 1: Running the Sysprep tool

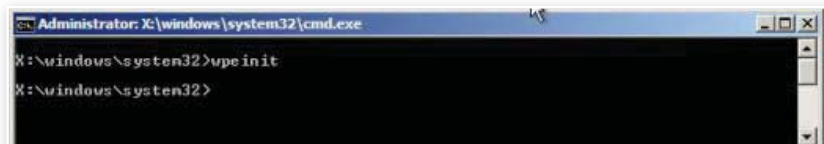


Figure 2: Creating a boot image

to add that image to the WDS server.

Before you can add a boot image, you need to create one using the Windows Automated Installation Kit (WAIK) 1.1. The WAIK is a free download from Microsoft that you install on the WDS server. After installation, click Start, All Programs, Microsoft Windows AIK, Windows PE Tools Command Prompt. (If you try to run this command in a normal command prompt, you'll get the error message *ImageX is not recognized as an internal or external command, operable program or batch file.*) If you're installing a 32-bit OS, you'll need a 32-bit boot image; for a 64-bit OS, a 64-bit boot image. To create a 32-bit boot image from the PE Tools Command Prompt, type:

```
copype x86 c:\winpe_32
```

To create a 64-bit boot image, type

```
copype x64 c:\winpe_64
```

You can find help for creating a custom boot image or WinPE in Mark Minasi's Windows Tech Support newsletter ([www.minasi.com](http://www.minasi.com)), issue 59, and in the Microsoft article "Creating Images" ([technet.microsoft.com/en-us/library/cc730907.aspx#BKMK\\_2](http://technet.microsoft.com/en-us/library/cc730907.aspx#BKMK_2)).

To add the new boot image to your WDS server, open the WDS snap-in and expand the Servers node, then expand your server. Right-click Boot Images and choose Add Boot Image. On the Image File page, browse

to C:\winpe, select winpe.wim, and click Next. On the Image Metadata page, give the image a name and description, then click Next. For this example, I named mine "Create Image." You can review your settings on the Summary page. If they are OK, click Next. When the task progress bar shows Operation Complete, click Finish. Your new boot image should be listed in the results pane. Next, you need to add a second boot image, which you'll find on the Vista (or Server 2008) DVD in the Sources folder. Follow the above steps to add the boot image, but this time browse to the Vista DVD \Sources folder, select boot.wim, and name it "Deploy Image." You're not ready to boot the image yet, but you'll need it for the next section.

### Creating a New OS Image Using WDS Capture

To create your OS image, you'll need a baremetal machine. Install an OS (Vista, Server 2008, XP, or Windows Server 2003 are supported, but this article is specific to Vista and Server 2008), and configure it as you wish. Now, you're ready to use Sysprep to prepare the machine, which removes all the uniquely identifying information, such as computer name and IP information. To run Sysprep, click Start and choose Run. In the Run box, type sysprep. Double-click sysprep.exe when it appears in the results pane. In the Sysprep dialog box, select the Generalize check box and choose Shutdown in the Shutdown Options drop-down menu,

as Figure 1 shows. Click OK. When Sysprep completes, the computer will shut down.

Next you'll need to perform a network boot (aka PXE boot) on the Sysprepped machine. Restart the computer and get ready to perform a network boot—this happens really fast. Some machines make you press F12, some F2, and others have a special key you press for a network boot. If you don't get the option to perform a network boot, you might need to change the system BIOS to include the option to do a network boot (Editing a system's BIOS is different for each type of computer so you might need to do some research for the type of computer you're working on.) The screen will remain black while the machine is getting an IP address from a DHCP server. You'll then be prompted to "Press F12 for Network Service Boot."

Select Create Image from the boot image choices that you added to the WDS server. Once the Create Image has booted, you will see a screen similar to the one Figure 2 shows. At the X:\windows\system32> com-

mand prompt, type

Wdsapture

The Welcome to the Windows Deployment Services Image Capture Wizard screen will appear. Click Next. On the Image Capture Source page, choose the volume to capture from the drop-down list of available volumes. If the C: volume does *not* appear, then Sysprep wasn't performed correctly. This is a common mistake; it's easy to forget to put a check mark in Sysprep's Generalize box. If no drive letters are displayed in the drop-down box, you'll need to boot the machine, answer the questions asked by Sysprep's mini-setup wizard, and run Sysprep again. After choosing the volume

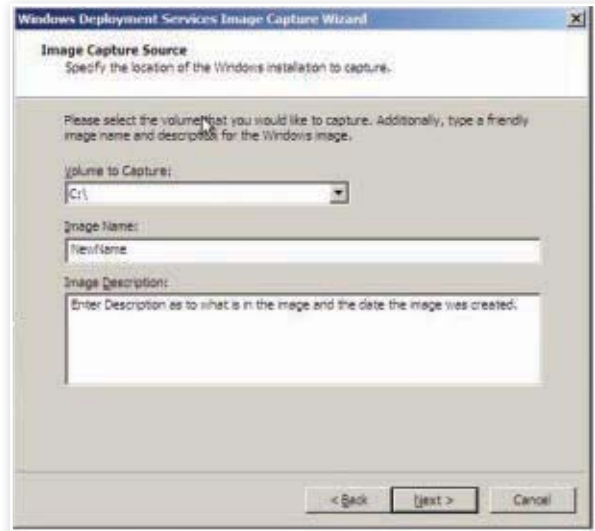


Figure 3: Capturing the OS image to deploy

to capture, give the new image a name and description as Figure 3 shows. Click Next.

On the Image Capture Destination page, shown in Figure 4, page 30, browse for the folder in which to store the image (must be on a local drive). Enter the name of the

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image to be created and click Save. You have no choice here—you must save the image locally. Select *Upload image to WDS server*. Type the IP address of the WDS server. (You can use the name of the WDS server, but name resolution issues can cause the connection to the server to fail. The IP address is more reliable.)

You'll be prompted to enter credentials to authenticate to the WDS server. Type the username and password and click OK. When the authentication completes, you'll see a list of image groups in the *Image Group name* drop-down menu. Select the image group in which you want to store your new image, as Figure 5 shows, and click Finish. The image will appear in the results pane in the WDS snap-in under Install Images and the Image group you choose.

Image groups reduce the amount of storage space needed for your images. Think of it like this: You add the first Server 2008 Enterprise OS image to an image group named Ent08. When you add the second Server 2008 Enterprise OS image (with different applications from the first) to the Ent08 image group, single instancing wakes up and checks each file before storing it. If a file already exists in the image group, the file itself is not stored again, but a pointer to the one and only file is created.

## Multicast Transmissions

Images can be rather large—often too large to fit inside a single data packet to cross the network wire. Therefore, the image is sent across the network in many data packets. Multicast transmissions are new with Server 2008. Earlier versions had unicast transmissions only. What's the difference? Let's look.

Let's say two clients are requesting the same image from a WDS server. The image is broken down at the packet level and sent across the network. The server sends packet 1 of the image to client 1, then sends the same packet to client 2, and so on until the

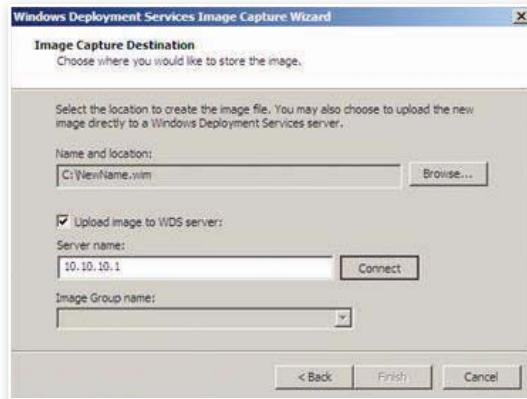


Figure 4: Storing the OS image

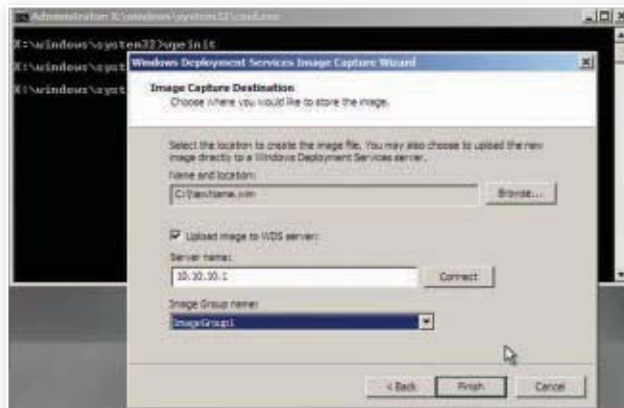


Figure 5: Uploading OS image to the WDS server

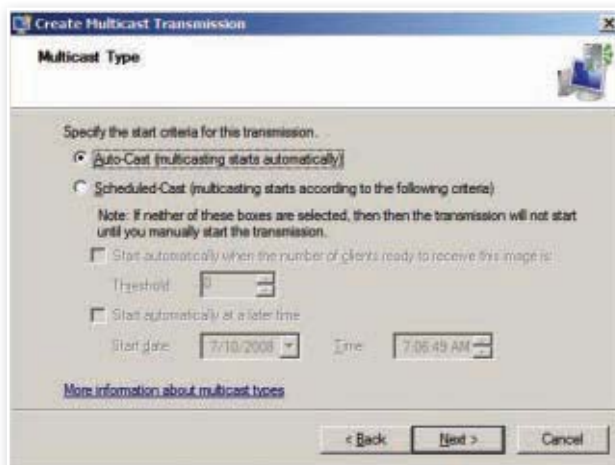


Figure 6: Creating a multicast transmission

entire image is deployed.

Imagine the workload that would be placed on the WDS server if there were 100 clients requesting the same image—packet 1 would be sent 100 times. With multicasting, when both clients request the same image, the WDS server sends packet 1 to all clients that are listening for it, then sends packet 2, packet 3, and so on. The work-

load on the WDS server is greatly reduced because each packet is sent only once. But (and here's the bad news), multicast transmission is similar to broadcast traffic in that each packet is sent to a specific multicast IP address, so all machines will need to look at the packet to determine whether it's addressed to that client.

To create a multicast transmission, in the WDS snap-in, right-click the Multicast Transmissions node, and choose Create Multicast Transmissions. On the Transmissions Name page, type a friendly name and click Next. On the Select Image page, choose your image group from the *Select the image group that contains the image* drop-down list provided. Then, choose your image from the *Select the image* list and click Next.

The Multicast Type page, which Figure 6 shows, lets you turn on multicast for a specific image by selecting Auto-Cast. Auto-Cast uses new multicast technology that lets a client join the multicast transmission in midstream. For example, if 20 clients have already received packet 1624 and a new client joins, the new client would receive packet 1624 first and all subsequent packets until the image has been sent entirely. Then the client would ask the WDS server to start over again with packet 1.

The Scheduled-Cast option lets you schedule a transmission for when multicasting will be available. Scheduled-Cast requires that all clients be ready at the same time because the WDS server won't restart from packet 1 after it finishes sending the image. You have two scheduling options: Schedule when *x* number of clients have requested an image (where *x* is specified by you), or schedule the date and time when multicast will start. After choosing the start



criteria for the transmission, click Next. You have successfully created a multicast transmission when you see the Task Complete! message. Click Finish.

One important note about multicast transmissions: They are available only if the WinPE you boot the clients with is the boot.wim file from the Server 2008 DVD/Sources folder. The version that ships with Vista doesn't provide multicast functionality.

## Deploying the Image

To deploy an image, perform a network boot on the client. (F12 will perform a network boot.) Choose the boot image named Deploy Image (this is the boot.wim image you added from either the Vista or Server 2008 DVD/Sources folder). The Windows Deployment Services Wizard launches automatically. Select the language and input method (e.g., keyboard), and click Next. In the authentication dialog box, enter your DomainName\Username. For example, to authenticate as Administrator in the Bigfirm domain, type

Bigfirm\Administrator

You can also use a user principal name (UPN) by typing Administrator@Bigfirm.com. Provide a password and click OK. From the list of OS images displayed, select the image to deploy and click Next. The *Where do you want to install Windows* page lets you create and format a partition. Choose Drive options, New, and type the size (in MB) of your first partition. Click Apply. Then select Format, click OK, and click Next. The Installing Windows screen opens and displays the phases of the installation and which one is currently being processed.

Once the installation is complete, Sysprep's mini-setup wizard will prompt you for information such as administrative username and password, computer name, time zone, and a few other things. When you complete this last wizard, your image deployment is complete. You can automate the beginning and ending of your image deployment process so that you

don't have to choose the size of the first partition and file system used to format it or answer Sysprep's mini setup wizard questions at the end by creating answer files. You can find instructions and a list of settings and values in the "Unattended Windows Setup Reference" Help file that ships as part of WAIK.

## Just Try It

I hope that armed with this guidance, you'll be able to install, configure, and tweak WDS to fit your environment. Don't let the reputation of its predecessor deter you from taking a serious look at WDS. I think you'll be pleasantly surprised. And one thing is for sure—the price is right!

InstantDoc ID 100439

## Rhonda Layfield

(rhonda@minasi.com) is a 27-year IT veteran and one of 17 Deployment MVPs worldwide. She's a desktop deployment product specialist, co-authors publications with Mark Minasi, and recently completed a CBT Nugget video on deployment.

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# Top Ten Ways to VIRTUALIZE Your Infrastructure

*By Mel Beckman*

You know what IT infrastructure is: the applications, servers, storage, and networks that comprise your enterprise information ecosystem, plus the duct tape that holds it all together. It's growing, both in size and cost. Virtualization promises to help you cope with the growth. Here's a 10-step road map to moving your infrastructure to the Big V.

## 1. Plan a Little

Don't click that "Place Order" button for VMware just yet. V in "virtualization" stands for Vast, which is what the landscape of virtualization opportunities is. There's server virtualization, application virtualization, storage virtualization, desktop virtualization, even virtualization virtualization. Spend some time getting the lay of the land. An excellent starting point is the Virtualization Wikipedia entry: <http://en.wikipedia.org/wiki/Virtualization>. Weigh and rank the possibilities before investing any hands-on time in technologies V. Don't make a doctoral thesis out of the effort, though. There's fun to be had.

## 2. Play a Little

Virtualization technology is exciting stuff—but don't tell management! Fortunately, it costs nothing to experiment; vendors are positively throwing free V products at you. Start with VMware's free trial Workstation Edition; it's drop-dead simple. Next move on to the free VMware Server edition, and give Microsoft's utterly free stand-alone Hyper-V a whirl. Play with Sun's free Virtual Box. Just to see how much you don't yet know, try to run free open source software Xen. Ha ha! You're not so smart!

## 3. Build a V Lab

It's time to spend some money. How you get it is your business. You need three or four multi-core servers packed with RAM and a couple of 24-port VLAN-capable gigabit Ethernet switches. I saw some on the loading dock. Lash 'em up to create your personal virtualization test bed. Cram it into a corner of your office: your V Lab. Now you're cooking. You can install all manner of V platforms and products, gaining wisdom as a V Guru.

## 4. Roll out a virtual appliance

Management suspects something is up, due to the elevated temperature in your office. Time to show some results. That's easy to do with virtual appliances. You need but one. Check out [vmware.com/appliances/](http://vmware.com/appliances/) and [rpath.com](http://rpath.com). Perhaps you could measure and chart network performance. The Cacti network monitor VA is perfect. Or a spanking new AJAX-enabled CRM system might be even more impressive. Get your appliance up and running, then wait few days (Scotty's Motto: manage expectations). Unveil. Bask.

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## 5. Migrate an Existing Application

So far you haven't broken a sweat, at least not from effort. The next task, however, could be somewhat taxing, so choose carefully. Select an existing application—one spread across two or three physical servers—and migrate it; yes, migrate it, to virtual machines. Database on one, web on another, third thing on the third, etc. Hopefully you didn't pick something too hard. Use vendor migration tools (these are free, because once you migrate vendors hope you'll spend.). If it doesn't work, hide it.

## 6. Virtualize Some Storage

You're now a pro at spinning up VMs, but that pesky storage is a problem. Think about it. A VM crashes, you want to spin up a replacement; but, OMG, the DATA! Don't store your data in a VM. That's crazy talk. Virtualized data belongs in virtualized storage, on a virtualized Storage Area Network (SAN). But skip the too-pricey Fibre-spelled-the-British-way and all that specialized SAN hardware. Go straight to iSCSI, which is all software, free and easy.

## 7. Manage, Virtually

Holy cow, you've built a small empire! Now you know what they meant by server sprawl. Is that VM down? Is this one overloaded? Where's that new OS boot image? Better start managing this stuff. Fortunately, vendors are lobbying free management tools over the wall. Microsoft's Hyper-V Vista Management thingy, Sun's XVM Op Center, and many more. Some aren't free, but darn cheap: VMware's Virtual Center. You'll get dashboards. You'll get graphs. You'll be in control. Maybe.

## 8. Target the Basic Desktop

Good morning, Mr. Phelps. Desktop users have gone amuck. They are taking too much dang time to support because they keep installing stuff that breaks other stuff. This must stop. Your mission, should you decide to avoid insanity, is to virtualize desktops, so they can be made all the same, totally mobile for when nobody has their own office anymore, and easy to manage. And cheaper, too. Start with the basic desktop: user's that need only email and Office. They have no pull.

## 9. Break into Blades

Is it hot in here? Let's move those servers out of your office, man! By now management has given you a blank check, thanks to all the savings your virtualization adventures have generated. In the land of the V, the multi-core box is king. And the king of processor cores is undoubtedly the Blade Server, which concentrates a dozen or more servers in a single rack shelf, each with four, eight, maybe sixteen cores. Blades are the last word in economies of scale, so invest.

## 10. Fail Gracefully

When a real server dies, you have to get out screwdrivers and flashlights and whatnot, and spend hours fixing it. When a fake server dies, nothing bad happens—provided you've played your cores right. Every virtualization technology includes support for automatic fail-over: something dies, and something else is birthed to take its place. You fix broken things later. Learn about failover mechanisms and incorporate them at the start of every V project. Because fail-over will save your vacation.

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# Secure YOUR DNS Servers

Proper configuration can keep DNS from being your network's Achilles' heel

by Mark Burnett

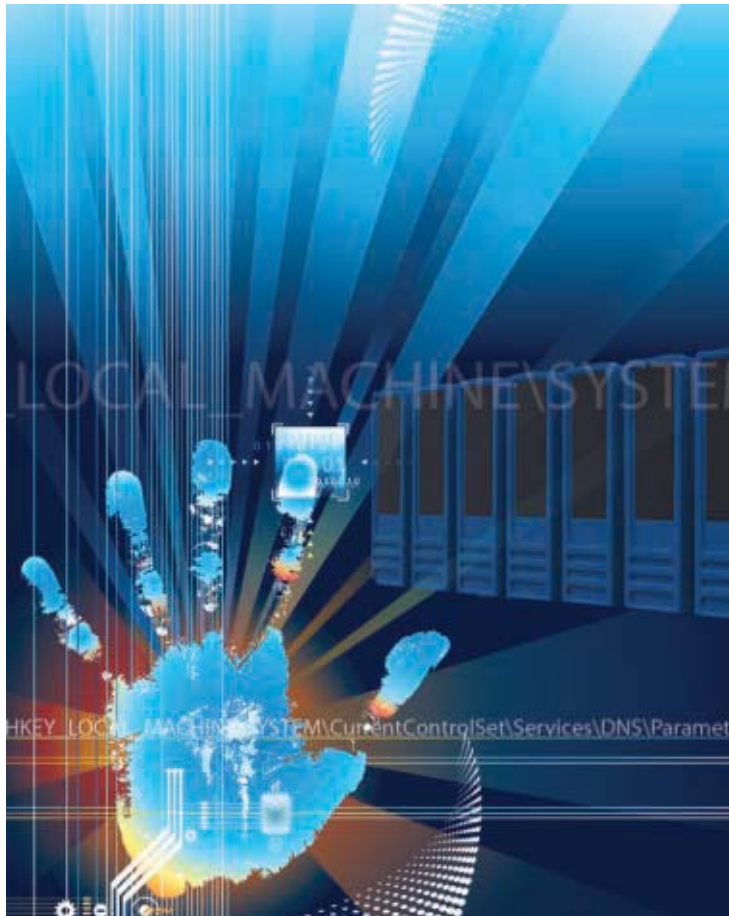
**T**he DNS protocol is peculiar. It's one of the oldest, most universally used, and most crucial of all networking protocols, but it's still the source of many network security problems. DNS has some fundamental limitations, but there's no reason for it to be the weakest link in your organization's security.

Perhaps it's DNS's apparent simplicity that breeds complacency toward DNS security. It's easy to set up a DNS server and forget about it, but an incorrectly configured and neglected DNS server can be a significant security problem. DNS services, as providers of network information, will always be targets for reconnaissance and information gathering, but careful planning and vigilance will minimize the risk of malicious hackers using your own servers against you. You can do much to build a solid and secure DNS infrastructure on your network, whether you're using Microsoft DNS or BIND. (For information about the security differences between BIND and Microsoft DNS, see the sidebar "Microsoft DNS vs. BIND," page 34.)

## DNS Server Attacks

To secure a DNS server, you need to understand how others might exploit it. The most common threats are Denial of Service (DoS) attacks, tampering with DNS records, and information gathering. DoS attacks are probably the most common threat because they're remarkably easy to pull off, thanks to the large number of incorrectly configured DNS servers on the Internet. DNS servers are often the launching points for DoS attacks, wherein an attacker uses a DNS server that allows recursion to pummel another server with packets. This kind of attack starves the target server of resources and prevents legitimate users from accessing it.

DNS tampering, which takes several forms, is less common but still a threat. One common method of DNS tampering is cache poisoning, in which an attacker injects fake records into a DNS server's cache. Other methods of modifying DNS records include forged



packets, man-in-the-middle attacks, and rogue DNS servers. In addition to modifying records, attackers use DNS servers for information gathering through DNS server mining, zone transfers, and DNS packet interception. Properly configured DNS servers can greatly limit your exposure to all these tactics.

### Isolate DNS Functions

The first step to preventing attacks on DNS servers is to plan your network infrastructure so that you isolate DNS server functions. The term *DNS server* describes two very different functions—a fact that can lead to confusion during configuration. A DNS server can be an advertiser of information, or it can be a gatherer (resolver) of information stored elsewhere. To maximize security, it should never perform both functions simultaneously.

Your DNS advertiser stores and publishes authoritative records about a domain that you control. The DNS advertiser could be a public DNS server, which tells outsiders how to reach your website or mail servers, or an internal Active Directory DNS server, which tells clients where to find resources such as domain controllers. In contrast, your DNS resolver accepts DNS requests from within your organization and contacts outside DNS servers as necessary to locate host information. DNS resolvers can cache records to speed up future lookups and can act as forwarders to redirect client lookups to different DNS servers.

Most DNS servers work fine performing both functions at once, and organizations commonly have several DNS servers that

perform both. This practice, however, is the primary reason so many DNS servers are vulnerable. You should have at least three distinct server roles on your network: Internet-facing DNS advertisers for publicly available servers, private DNS advertisers for AD and other internal DNS records, and DNS resolvers to perform lookups, caching, and forwarding for internal clients.

You should split these roles to improve performance and limit exposure to cache poisoning and DoS attacks. To further mitigate DoS attacks, you should have at least two servers in each role. Although many companies use a single DNS server for all roles, isolating server roles is always the best practice, because even if a configuration is not vulnerable now, it could become vulnerable in the future.

Carefully securing all DNS server roles is important, but I want to focus on the most crucial role: the Internet-facing advertisers.

### Public DNS Advertisers

Your Internet-facing DNS advertisers are the only DNS servers visible outside your network, so you need to limit the information stored on them; otherwise, attackers might exploit them. Public advertisers should hold only public host records and should publish records only for servers accessible from the Internet—for example, web, mail, and FTP servers. Public advertisers should contain only public IP addresses and other public records such as Sender Policy Framework records and basic contact information. If any of your network adaptors point to your public DNS servers, chances are you have a problem to fix.

Although controlling information is important, your primary strategy for securing public advertisers should be to make sure they respond only to requests for the records they hold. They should never perform DNS lookups or look up other information on behalf of someone requesting records. Limiting responses will eliminate cache poisoning and prevent others from using your DNS server as a reflector in a DoS attack. Several steps are necessary in both BIND and Microsoft DNS to secure public advertisers.

### Disable Recursion

Recursion allows a DNS server to track down a host record on behalf of another server. The problem with recursion is that in the process of performing lookups for others, a DNS server might be vulnerable to cache poisoning. Furthermore, attackers often use recursive DNS servers as part of a distributed DoS attack.

Attackers perform DoS attacks by creating large DNS records on servers that they control, then sending thousands of requests to recursive DNS servers all over the Internet. The requests are spoofed to look as if they come from a single IP address, so each DNS server will grab the record, cache it, and return it to the spoofed IP address. By repeating this process, the attacker can flood a target server with packets. The only way to prevent the flood would be to configure every public DNS server on the Internet to block recursive queries. Fixing the estimated half-million DNS servers that allow recursion is impossible, but you can do your part by fixing your own servers.

To disable recursion with Microsoft DNS, open the DNS Management Console, right-click the computer name in the left pane, and select Properties. Click the Advanced tab and select the *Disable recursion* check box, as Figure 1 shows. Also, confirm that the *Secure cache against pollution* option is selected.

If you use BIND, you can disable recursion by adding the following to the options section in `named.conf`:

```
Options {  
    recursion no;  
};
```

Note that with BIND, you can use an allow-recursion ACL to permit recursion only from

## Microsoft DNS vs. BIND

You might ask which is more secure, Microsoft DNS (which comes with Windows) or the more common BIND. Most organizations that have Windows-based networks rely on Microsoft DNS because it's a core component of Active Directory, but many people claim that BIND is more secure.

Comparing the security of the two products is difficult. BIND allows for finer configuration and has full DNS Security Extensions support, but it has a longer history of security flaws than Microsoft's DNS implementation. Microsoft DNS is easier to configure, so some argue that there's a smaller chance for configuration errors. However, because it's easy to configure, inexperienced administrators might use it and introduce errors. Ultimately, you can build a secure DNS server with either of the two products. Unlike most security vulnerabilities, DNS problems are more often a result of configuration errors rather than software flaws.



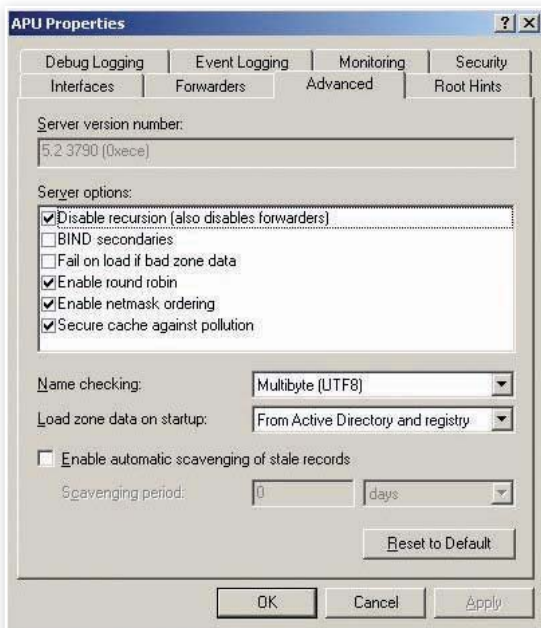


Figure 1: Disabling DNS recursion

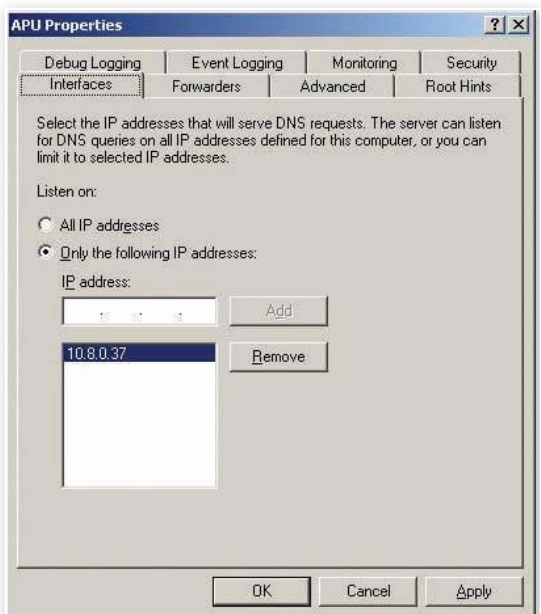


Figure 2: Limiting the IP addresses DNS listens to

trusted IP addresses. Although this might be the only possible solution in some configurations, the best protection is to prevent all recursion on public DNS servers.

## Limit Zone Transfers

A surprisingly common DNS server mistake is allowing all hosts to perform zone transfers and allowing all records for a zone to be returned. Zone transfers let DNS servers share information, but you should be careful to limit which hosts can request them. If you don't normally allow servers to update each

other, you can completely disable zone transfers.

To limit zone transfers with Microsoft DNS, open the DNS Management Console, right-click the domain you want to configure, click Properties, then access the Zone Transfers tab. If you want to enable zone transfers, be sure to allow only servers listed on the Name Servers tab or use specific IP addresses. Never allow zone transfers to all servers.

With BIND, you control this setting in `named.conf`. You can make the setting in either the global options section or individual zone sections. Keep in mind that settings in a zone section override that zone's global options, so the best way to manage zone transfers is to prevent them globally, then configure individual zones to allow zone-transfer requests only from certain IP addresses. To do so, add to `named.conf` as follows:

```
Options {
    recursion no;
    fetch-glue no;
    allow-transfer { none; };
};

zone "example.com" in {
    ...
    allow-transfer
    ( 192.168.0.15; );
};
```

## Reduce Exposure

To prevent abuse, it's important to limit all network services to specific ports and IP addresses. You should always use a packet filter, such as a firewall or router, to limit access to your DNS servers, and you should configure limitations on the servers themselves. To configure Microsoft DNS to listen only on specific IP addresses, you can open the DNS Management Console, right-click the computer name, select Properties, and select the Interfaces tab. You can then enter specific IP addresses you want to listen on,

as Figure 2 shows.

With BIND, you can set the listening IP address as a global option or a zone option in `named.conf` as follows:

```
Options {
    recursion no;
    fetch-glue no;
    allow-transfer { none; };
    listen-on { 192.168.0.8; };
};
```

With Microsoft DNS, it's possible to manage a remote DNS server using the remote procedure call (RPC) protocol. If you don't use this feature, you should disable RPC to reduce your attack surface. To do so, you must edit the server's registry. Using Regedit, locate `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\DNS\Parameters`, and create a DWORD value named `RpcProtocol`. Set this value to 0, and restart the DNS server for the setting to take effect.

## You Can Do More

At this point, your DNS server won't allow recursive DNS requests from others, won't attempt to answer queries outside its zones, will permit zone transfers only to trusted hosts, and will listen only on the IP addresses you specified. If it contains only public DNS records, the server is now secure enough to be a public DNS advertiser. With prudent firewall configuration, careful patch management, and other security best practices in place, you can be confident that your DNS server isn't a threat to your network or others.

However, you can do more. Using IPsec between trusted hosts and implementing the DNS Security Extensions (DNSSEC) and Transaction Signature extensions can further increase the integrity and confidentiality of your DNS traffic. Careful server hardening will prevent other types of attacks on your DNS server. Finally, a good network-monitoring system can warn you of impending attacks.

InstantDoc ID 100432



## Mark Burnett

(mburnett@xato.net) is an independent consultant specializing in Windows security. He is a Security MVP and the author of several books, including *Perfect Passwords* and *Hacking the Code* (Syngress). Visit Mark's blog at xato.net.

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# Test for Numerous Conditions with PowerShell's *switch* Statement

**W**indows PowerShell's *switch* statement is a powerful language construct that lets you test for specific conditions, similar to an *if* statement. However, a switch statement is easier to implement when you want to evaluate numerous conditions. Let's look at the various components that make up the switch statement and explore how to use them to automate such tasks as retrieving System event log entries and performing certain actions based on the type of entry, and moving and deleting files based on their filenames.

## Creating Switch Statements

The switch statement compares one or more values to one or more conditions. For each condition that evaluates to true, the statement runs the script block associated with that condition. To better understand how a switch statement works, let's take a look at its syntax:

```
switch <options> (<collection>)
{
    <condition 1> {<script block 1>}
    [<condition 2> {<script block 2>}]
    [<condition 3> {<script block 3>}]
    [<condition n> {<script block n>}]
    [default {<default script block>}]
}
```

The first line begins with the keyword *switch*, followed by one or more options and a collection. The switch statement supports five options that let you, for example, use wildcards and regular expressions. The collection, which is enclosed in parentheses, contains what you're checking (e.g., events, files). It can consist of zero or more elements.

The braces in the second and last line enclose the switch statement's script block. The first line in this block includes a condition and that condition's script block, which is also enclosed in braces. If the condition evaluates to true, the condition's script block runs. You can include as many condition/script block pairs as necessary. In addition, you can include an optional default clause that



Lesson 3 in the PowerShell 201 series explores how and when to use the switch statement's components

by Robert Sheldon



## Listing 1: Code That Retrieves the Most Recent Entry in the System Event Log

```
$event = Get-EventLog "system" -Newest 1
switch ($event.EntryType)
{
    "error"
    {
        "ERROR: " + $event.Message
    }
    "warning"
    {
        "WARNING: " + $event.Message
    }
    "information"
    {
        "Info only: " + $event.Message
    }
}
```

## Listing 2: Code That Shows Another Way to Retrieve the Most Recent Entry in the System Event Log

```
$event = Get-EventLog "system" -Newest 1
switch ($event)
{
    {$_ .EntryType -eq "error"}
    {
        "ERROR: " + $_.message
    }
    {$_ .EntryType -eq "warning"}
    {
        "WARNING: " + $_.message
    }
    {$_ .EntryType -eq "information"}
    {
        "Info only: " + $event.message
    }
}
```

## Listing 3: Code That Retrieves the 10 Most Recent Entries in the System Event Log

```
$event = Get-EventLog "system" -Newest 10
switch ($event)
{
    {$_ .EntryType -eq "error"}
    {
        "ERROR: " + $_.message
        Write-Host
    }
    {$_ .EntryType -eq "warning"}
    {
        "WARNING: " + $_.message
        Write-Host
    }
    {$_ .EntryType -eq "information"}
    {
        "Info only: " + $_.message
        Write-Host
    }
}
```

## Listing 4: Code That Uses a Default Clause

```
$event = Get-EventLog "system" -Newest 10
switch ($event)
{
    {$_ .EntryType -eq "error"}
    {
        "ERROR: " + $_.message
        Write-Host
    }
    {$_ .EntryType -eq "warning"}
    {
        "WARNING: " + $_.message
        Write-Host
    }
    default
    {
        "Info only: " + $_.message
        Write-Host
    }
}
```

contains a script block, which runs only when none of the conditions evaluate to true.

Now let's look at an example. The code in Listing 1 defines the \$event variable and uses that variable in a switch statement. The first line uses the Get-EventLog cmdlet to retrieve the most recent event from the local computer's System event log. When you use this cmdlet to retrieve System event log entries, it returns a Microsoft .NET Framework System.Diagnostics.EventLog-Entry object for each event. This object returns the information you typically find in a System event log entry, such as the when the event occurred, the type of event, and the event's message.

In Listing 1, the Get-EventLog cmdlet assigns the information from the most recent event to the \$event variable. Using the EventLogEntry object's EntryType property, the switch statement retrieves the type of event and compares that element to the defined conditions.

In a switch statement, you can simply specify a value as a condition. PowerShell then automatically compares that value to each collection element. As callout A in Listing 1 shows, the first condition is defined as error. When this value is equal to the collection element (i.e., the EntryType property value), the condition evaluates to true and the script block runs. In other words, when the event type is error, the script block outputs the word ERROR: followed by the

## Learning Path

### WINDOWS IT PRO RESOURCES

To read the previous lessons in the PowerShell 201 series, go to

"Iterating Through Collections with PowerShell's foreach Loops," InstantDoc ID 99873

"Controlling Your Code's Flow with PowerShell's Conditional Statements," InstantDoc ID 100141

event's message, which is obtained using the EventLogEntry object's Message property.

The switch statement's script block contains two other conditions, but you can define as many conditions as necessary. For each condition that evaluates to true, the associated script block runs. If multiple conditions evaluate to true, all associated script blocks run. In this example, only one condition script block will run because the collection contains only one element.

Note that, by default, the switch statement is case insensitive. For example, you can spell the first condition as error, ERROR, or Error, and the results will be the same. However, you can override this default behavior by specifying the -casesensitive option, as in

```
switch -casesensitive ($event.EntryType)
```

One other point I want to make concerns the collection. The code in Listing 1 retrieves the EntryType property value as part of the collection. However, you can retrieve

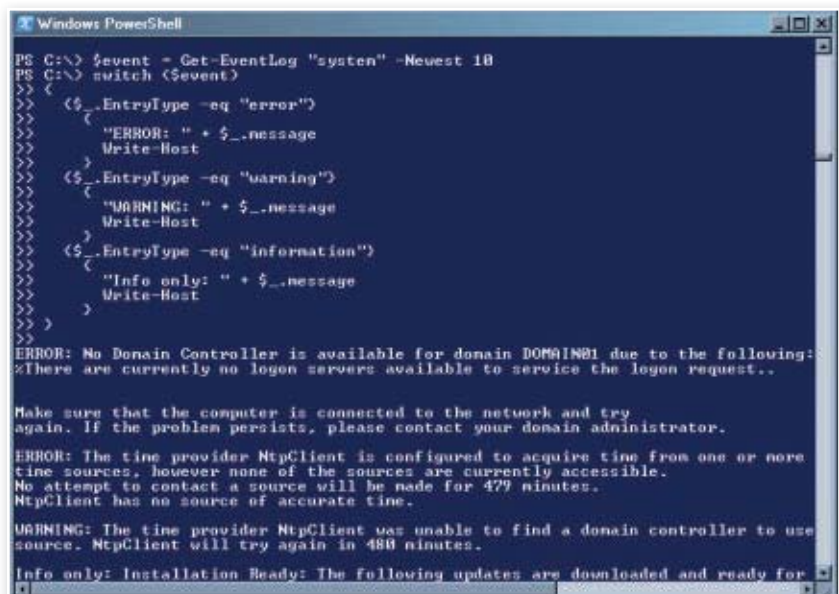


Figure 1: Retrieving the 10 most recent entries in the System event log

Listing 5: Code That Uses Wildcards to Move Files

```
$files = dir C:\ArchivedFiles\*.txt
switch -wildcard ($files)
{
    *2007*
    {
        move $_ C:\ArchivedFiles\2007
        $_.name + " moved."
    }
    *2006*
    {
        move $_ C:\ArchivedFiles\2006
        $_.name + " moved."
    }
    default
    {
        $_.name + " older than 2006."
    }
}
```

Listing 6: Code That Uses Regular Expressions to Delete and Move Files

```
$files = dir C:\ArchivedFiles\*.txt
switch -regex ($files)
{
    A archive.._200[3-5].txt
    {
        del $_
        $_.name + " deleted."
    }
    B archive.._2006.txt
    {
        move $_ C:\ArchivedFiles\2006
        $_.name + " moved."
    }
    default
    {
        move $_ C:\ArchivedFiles\2007
        $_.name + " moved."
    }
}
```

that value in the conditions, as shown in Listing 2.

Notice that the collection now includes only *\$event*. The conditions use the *\$\_* built-in variable to reference the current *\$event* value, then use the *EntryType* property to retrieve the entry type. When you take this approach, you must define the entire condition and enclose it in braces. For example, the condition `{$_entrytype -eq "error"}` specifically says that the *EntryType* value must equal *error*. Listing 2 will return the same results as Listing 1.

When working with a collection that contains one element, you'll probably want to stick with the first approach because it's simpler. However, when a collection contains multiple elements, you have to use the second approach if the switch statement can't work with the collection as is. For example, if you use *Get-EventLog* to return multiple system events, you must retrieve the *EntryType* value in each condition, as Listing 3 shows. In this code, the collection

specifies only the variable name *\$events*. This collection contains the last 10 system events. The conditions use the *EntryType* property to retrieve the entry type. Listing 3 returns results similar to those in Figure 1.

If you refer back to the switch statement's syntax, notice that the last line in the statement's script block is a default clause. The code in Listing 4 uses a default clause rather than defining a third condition. Any event that doesn't contain an *EntryType* value of *error* or *warning* is treated as a default, which means that the returned message will begin with *Info only:*. Listing 4 returns the same results as Listing 3 but with a bit less work.

### Using Wildcards and Regular Expressions

By default, the string value specified in the switch statement's script block has to exactly match a condition for that condition to evaluate to true. This would be the same as using the *-exact* option in a switch statement. Even though the option isn't necessary for exact matches, a person might include it to ensure that the intent of the code is clear, should anyone else review the code.

Besides the *-exact* option, there are options that let you use wildcards (*-wildcard* option) or regular expressions (*-regex* option) in switch statements. (If you're unfamiliar with wildcards

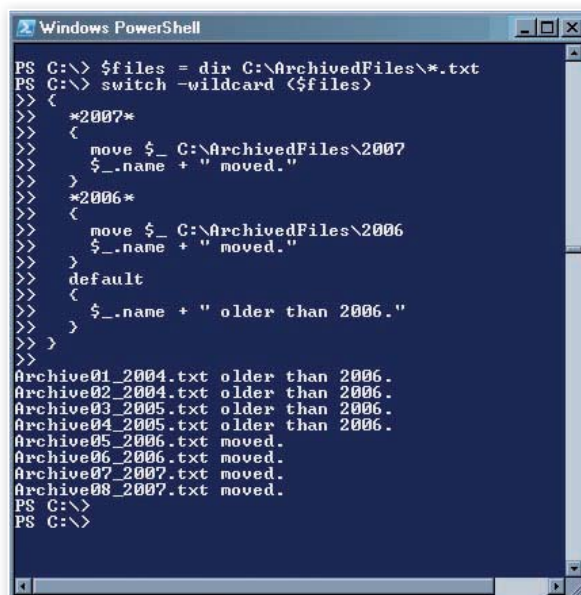


Figure 2: Moving files with the help of wildcards

or regular expressions, see the PowerShell help topics about\_wildcard and about\_regular\_expression.) For example, the switch statement in Listing 5 uses wildcards to move files. The first line retrieves a list of text files and assigns them to the *\$files* variable, which becomes the collection. Notice that (*\$files*) is preceded by the *-wildcard* option, which tells PowerShell that wildcards will be used.

For example, the condition in callout A in Listing 5 uses the wildcard *\*2007\**, which means the filename must contain the string *2007*, with any number of characters on either

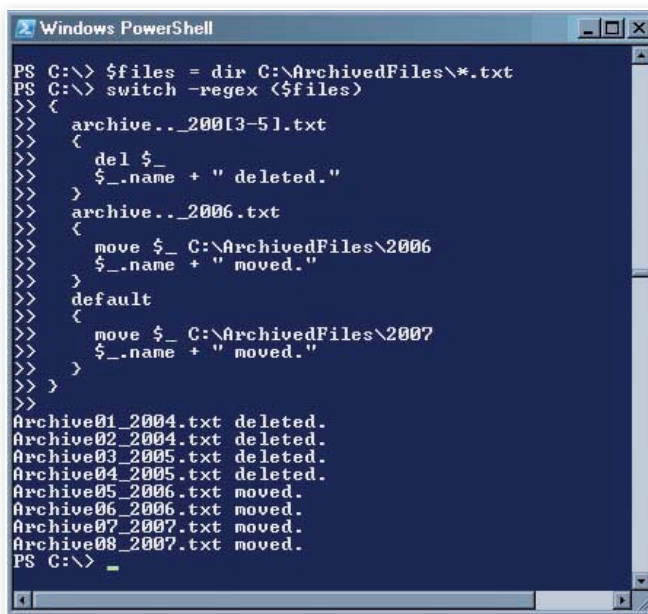


Figure 3: Deleting and moving files with the help of regular expressions

Listing 7: Code That Uses the -regex and -casesensitive Options

```
$files = dir C:\ArchivedFiles\*.txt
switch -regex -case ($files)
{
    archive.._200[3-5].txt
    {
        del $_
        $_.name + " deleted."
    }
    archive.._2006.txt
    {
        move $_ C:\ArchivedFiles\2006
        $_.name + " moved."
    }
    default
    {
        move $_ C:\ArchivedFiles\2007
        $_.name + " moved."
    }
}
```

side. If a filename contains the string 2007, the switch statement moves the file to the 2007 folder and displays a message indicating that the file has been moved. Because the collection contained eight files, PowerShell returns eight messages, as shown in Figure 2.

Like Listings 3 and 4, Listing 5 uses only a variable name (e.g., \$files, \$event) for the collection. Unlike Listings 3 and 4, Listing 5 specifies only the \$\_ built-in variable in each condition and not \$\_.PropertyName (where *PropertyName* is the name of the property you want to retrieve). Sometimes the only way to know which technique will work is through trial and error.

When you want to use regular expressions, you use the -regex option. For example, the switch statement in Listing 6 uses two regular expressions, the first of which

is in the condition in callout A. This condition uses the regular expression *archive..\_200[3-5].txt* to delete any file whose filename begins with the string *archive* and ends with the string *\_2003.txt*, *\_2004.txt*, or *\_2005.txt*. The condition in callout B uses the regular

expression *archive..\_2006.txt* to move any file that begins with the string *archive* and ends with the string *\_2006.txt* to the 2006 folder. The default clause moves all other files to the 2007 folder. Figure 3 shows the messages outputted from the code in Listing 6.

As I mentioned previously, the switch statement supports the -casesensitive option, which lets you make the matching process case sensitive. You can use this option with other options, as Listing 7 shows. In this code, notice that I use -case instead of -casesensitive. You can use a short version of an option name if PowerShell can distinguish the correct option.

With the addition of the -casesensitive option, the filenames' cases must exactly match. For example, the second condition (archive..\_2006.txt) evaluates to true for archive05\_2006.txt but not for Archive05\_2006.txt. Because all eight files begin with

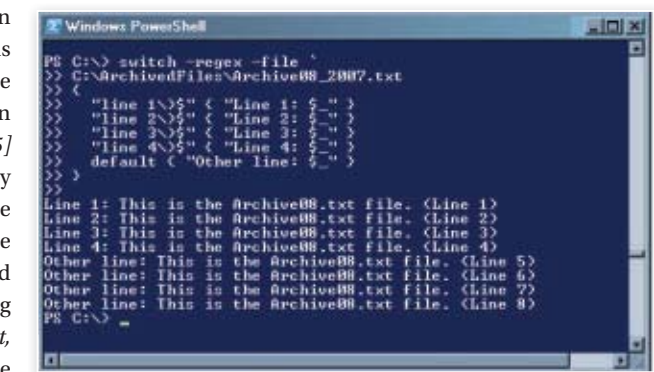


Figure 5: Using a file's contents as a collection

```
switch -regex -file `
C:\ArchivedFiles\Archive08_2007.txt
{
    "line 1\"$_" { "Line 1: $_" }
    "line 2\"$_" { "Line 2: $_" }
    "line 3\"$_" { "Line 3: $_" }
    "line 4\"$_" { "Line 4: $_" }
    default { "Other line: $_" }
}
```

As this example shows, you must include the file's pathname after the keyword -file. In the switch statement's script block, the first condition specifies that a line must end in the string *line 1*. If the condition evaluates to true, the phrase *Line 1:* is printed, followed by the line itself (\$\_). If none of the four conditions evaluate to true, the default clause runs, as shown in Figure 5.

## Moving Forward

The switch statement is a valuable tool for working with collections and multiple conditions. You can make the statement as simple or as complex as necessary. For example, you can embed other types of flow control statements within the conditions' script blocks. Be sure to try out various configurations and access different types of data stores to better learn how to take full advantage of all that the switch statement has to offer.

InstantDoc ID 100411

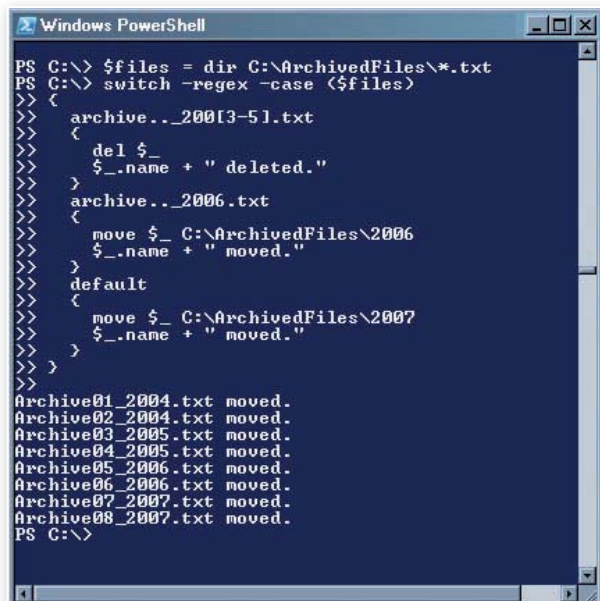


Figure 4: Result of using a case-sensitive switch statement

## Working with a File's Contents

Another useful option is -file. You use this option when you want to use a file's contents as the collection. Each line in the file represents an element in the collection. For example, the following switch statement retrieves the Archive08\_2007.txt file's contents:



### Robert Sheldon

(contact@rsheldon.com) is a technical consultant and author of material about Windows, relational database management systems, and business intelligence design and implementation. His latest book is *Beginning MySQL* (Wiley). Find out more at [www.rsheldon.com](http://www.rsheldon.com).





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# Emailing SharePoint 2007 Lists and Libraries

**W**indows SharePoint Services (WSS) 3.0 and Microsoft Office SharePoint Server (MOSS) 2007 let users contribute content to lists and libraries via email. This ability adds to existing methods such as uploading through the browser and offers end users more flexibility in the way they contribute to team sites. Email is an especially useful way of contributing SharePoint content for the road warrior who might not always have a direct connection to the network.

Microsoft SharePoint Portal Server 2003 let you email documents into document libraries via an Exchange Server mail-enabled public folder—a cumbersome, circuitous method. WSS 3.0 and MOSS 2007 improve the process with the ability to send messages directly into many types of lists and libraries without relying on Exchange public folders. This is a welcome development, but there are some implementation issues that could trip you up along the way. In this article, I show you how emailing works with SharePoint 2007 and highlight some problems you should be aware of. SharePoint also supports outgoing email for notification of various events, but that's outside the scope of this article.

Follow these  
guidelines to  
email-enable  
SharePoint for easy  
updates

by Kevin Laahs

## Basic Architecture

First, I'd like to make it clear that SharePoint is not an SMTP engine, and it doesn't care what messaging system you use; Exchange (or any other specific messaging system) isn't required to be able to email items into SharePoint lists and libraries. Essentially, SharePoint monitors a folder location looking for correctly formatted SMTP messages. SharePoint doesn't care how those messages arrive in the folder—it just opens them up and tries to associate each message with a list or library somewhere in the SharePoint farm. It doesn't return delivery failures nor does it process requests for read or delivery receipts—which is what I mean by it not being an SMTP engine in itself.

In a typical environment, the folder that SharePoint monitors is the drop folder of the SMTP service running on web front-end servers within the farm. The general messaging infrastructure is configured such that SharePoint-bound messages are routed to the SMTP service. How this routing is achieved differs in





## ■ EMAILING SHAREPOINT

each organization, but typically SharePoint is identified using its own SMTP namespace, and a combination of mail exchanger (MX) records and messaging connectors route traffic appropriately.

If an item in the monitored folder can be successfully parsed as an SMTP message, SharePoint uses the To address to look up the destination list or library in the current farm. Depending on various configuration options—such as who is allowed to send mail to a particular list and the type of list it is—the email and attachments are added to that list; they become normal list items and therefore benefit from core SharePoint services such as search and views.

### Configuring Incoming-Email Settings

For this emailing structure to be successful, you have to configure how and where the web front-end servers monitor the drop folder, how to match incoming email addresses to lists and libraries, and how to control who is allowed to do what via email. The first step is to enable processing for incoming email at the farm level through the Operations tab in SharePoint Central Administration. With incoming mail enabled, SharePoint starts a background timer job called Windows SharePoint Services Incoming E-Mail that runs every minute on all web front-end servers to poll the drop folder for new messages. As with all timer jobs, this job is controlled

by the Windows SharePoint Services Timer service; if the Timer service isn't running, incoming email won't be processed.

The incoming-email job runs by default on all front-end servers, but the configuration for the drop folder is set farmwide. Therefore, all web front-end servers in a farm that run the incoming-email service must have a drop folder in the same location. So, if the drop folder is configured as C:\Drop, all web front-end servers must have a C:\Drop folder and your mail routing topology must ensure that incoming messages get deposited in this folder.

You should enable the Windows SMTP service on your front-end servers to receive email from other SMTP servers—for example, so you can send messages from Exchange 2007 directly into WSS. The automatic configuration mode on the Configure Incoming E-Mail Settings page in Central Administration meets the needs of most organizations. However, if you're not using the Windows SMTP service and want to populate a drop folder via some other mechanism, you'll need to manually configure the settings using the advanced mode, which reveals configuration settings for the drop folder in the UI. Note that using the advanced mode disables the ability to specify safe SMTP servers.

In the automatic mode, you can indicate that all incoming mail is acceptable or

you can specify a list of IP addresses that equate to those SMTP servers you're happy to process mail from. Your choice depends on your overall SMTP routing topology. For example, you might have one central SMTP server that all mail passes through and you want this server to be the only one from which you're willing to process mail. The incoming-email service analyzes the Received header inside each message it picks up from the drop folder to determine whether to accept the message.

If you're not using the automatic mode, you have to ensure that the account used to run the Windows SharePoint Services Timer service has modify permissions on the specified drop folder so that it can delete messages after processing them. Failing to do so results in messages being delivered multiple times.

The last piece of configuration for this stage is to indicate which SMTP domain your WSS farm processes mail for. For example, with an email address of mi6@wss.spysrus.com, the SMTP domain is wss.spysrus.com. In this example, any email-enabled list or library would have an address of *something*@wss.spysrus.com. The challenge from an infrastructure point of view is to ensure that every email message addressed to wss.spysrus.com finds its way to a web front-end server with the incoming email service enabled. You could do this many

Spys R Us > Documents > Settings > Incoming E-Mail Settings

### Incoming E-Mail Settings: Documents

Use this page to change the e-mail settings of this document library. You can set the e-mail address for this document library, choose to save or discard e-mail attachments, and set e-mail security policy.

**Incoming E-Mail**  
Specify whether to allow items to be added to this document library through e-mail. Users can send e-mail messages directly to the document library by using the e-mail address you specify.

Allow this document library to receive e-mail?  
☐ Yes ☒ No

E-mail address:

**E-Mail Attachments**  
Specify whether to group attachments in folders, and whether to overwrite existing files with the same name as incoming files.

Group attachments in folders?  
☒ Save all attachments in root folder  
☐ Save all attachments in folders grouped by e-mail subject  
☐ Save all attachments in folders grouped by e-mail sender

Overwrite files with the same name?  
☐ Yes ☒ No

**E-Mail Message**  
Specify whether to save the original .eml file for an incoming e-mail message.

Save original e-mail?  
☐ Yes ☒ No

**E-Mail Meeting Invitations**  
Specify whether to save e-mailed meeting invitations in this document library.

Save meeting invitations?  
☐ Yes ☒ No

**E-Mail Security**  
Use document library security for e-mail to ensure that only users who can write to the document library can send e-mail to the document library.

E-mail security policy:  
☒ Accept e-mail messages based on document library permissions  
☐ Accept e-mail messages from any sender

**Caution:** If you allow e-mail from any sender, you are bypassing the security settings for the document library. This means that anyone could send an e-mail to the document library's address and their item would be added. With this option turned on, you are opening your document library to spam or other unwanted e-mail messages.

Figure 1: Email settings for a document library

different ways, but it most likely involves setting up MX records in DNS and connectors from other internal mail systems. For example, in Exchange 2007 you could set up a Send connector that handles the wss.spysrus.com namespace and indicate that you want to forward all messages for that address space to a smart host—the smart host being your web front-end server.

## Enabling Delivery to a List or Library

After email is configured at the farm level, site administrators can email-enable individual lists and libraries. Not all list types can be enabled for email, but for those that can, you'll see an *Incoming email settings* option under the Communications section when viewing the settings for the list. The settings available depend on the list type—for example, a document library asks you what you want to do with attachments and a blog list lets you choose whether the incoming item is published immediately. Figure 1 shows the settings available for a document library.

Every list you mail-enable needs to have an email address that's unique across the entire farm. But the site administrator can choose only the user part of the address, which SharePoint stores in the AllLists table within the content database associated with the site collection. The domain part of the address is configured at the farm level.

This naming method for email addresses probably isn't practical for most organizations. Why? First, SharePoint offers no governance on names, so it's a first-come, first-served situation for picking the user part of the name. And people will most likely choose common names for common lists—for example, what would you want the email address for your Announcements list to be? *Announcements@domain.com*? But so does everyone with a SharePoint site in the farm, and there's no way to check what other email addresses are currently in use other than by trial and error—SharePoint blocks you when you try to create a name that already exists. So this leads to end-user frustration. SharePoint also provides no way to validate that the email address conforms to corporate policies for formatting or the use of invalid or inappropriate names.

Furthermore, there's no way for the sender of a message to know whether it

was successfully delivered to the correct SharePoint list—if, indeed, it was delivered at all—except by physically visiting the intended destination. The SMTP service initially receives the incoming email message, but the service isn't tied to SharePoint in any way and therefore can't validate that the email address points to a list or library.

The last aspect to mention at this stage is the security that you can set for incoming email. You can choose to accept mail based only on the permissions set on the list or library itself or to accept mail from any sender.

## Directory Management Service

If you've sorted out your SMTP routing topology, you can now send items to SharePoint by entering the location's email address in a message. However, raw email addresses aren't necessarily user-friendly, so most email systems let you look up email addresses using common terms, such as first name and last name. WSS can leverage Active Directory (AD)—or a custom directory—for this very purpose via something called the Directory Management Service (DMS), a web service (SharepointEmailWS.asmx) that's installed out of the box on a web front-end server and enabled at the farm level using the incoming-email settings. Let's see how the DMS works and what problems it solves—and what problems it introduces to the mix.

The DMS creates Contact objects in AD to represent email-enabled lists and libraries. (It can also create distribution groups to represent the members of team sites, but that functionality is outside the scope of this article.) Your end users should be able

to benefit from these entries with the same address look-up functionality and email distribution as with other email-enabled objects. I say *should* because enabling the DMS creates some problems you won't have if you don't use it. Note that the DMS isn't mandatory for supporting incoming email.

Configuring the DMS is a matter of specifying an organizational unit (OU) in AD where the contacts will be created. Best practice is to create a MOSS-specific OU for easier all-around management. You need to provide the SharePoint Central Administration application pool account with write access to the OU, and therefore you'll have to work with whoever's in charge of your AD. You must also specify the name of the SMTP server for incoming mail—ultimately, this information finds its way onto the email addresses associated with the contacts that the DMS creates. Note that this address can be different from the Incoming E-Mail Server Display Address that you set during incoming-email configuration. The DMS-created address is the more user-friendly one that's displayed through the SharePoint UI, and you might have to subsequently update the AD-created object with this address so that it's a valid address to which mail can be routed. You can also indicate whether the AD Contact objects can receive mail only from authenticated users, which results in an Exchange-specific attribute being set on the Contact objects in AD. So, if you're using a different email system, this setting won't be applicable.

## Using the GAL—or Not

Table 1 shows the main attributes the DMS sets on Contact objects in addition to stan-

Table 1: Active Directory Attributes Used for Email

AD Attribute	Definition
Cn	The name part of the email address, specified by the user
displayName	The name of the list appended to the name of the site the list belongs in
givenName	The name of the site the list belongs in
mailNickname	Same as Cn
msExchRequireAuthToSendTo	True or False, depending on DMS configuration
Name	Same as Cn
Sn	The name of the list
targetAddress	The Cn followed by the incoming mail server specified during DMS configuration

dard system attributes. There are some limitations with these settings, however, not least the fact that in a pure Exchange 2007 environment, these settings are insufficient for a valid entry to appear in the Global Address List (GAL). Exchange 2003 and Exchange 2000 include an asynchronous component called the Recipient Update Service (RUS) that stamps AD objects with attributes such as proxyAddresses and showInAddressBook that Exchange relies on to identify recipients and route mail. This method of stamping addresses was removed from Exchange 2007; instead, all attributes are stamped at creation time—but only if you use Exchange Management Console (EMC) or Exchange Management Shell (EMS) to create your objects in the first place!

Therefore, to get your contacts correctly stamped in an environment that doesn't have RUS, you need to modify them after they're created. This process is discussed in the Exchange team's blog entry, "Good bye RUS" ([msexchangeteam.com/archive/2006/10/02/429053.aspx](http://msexchangeteam.com/archive/2006/10/02/429053.aspx)). Essentially, you need to update all relevant address lists with the following EMS commands:

```
Get-EmailAddressPolicy |
    Update-EmailAddressPolicy
Get-AddressList | Update-AddressList
Get-GlobalAddressList |
    Update-GlobalAddressList
```

The second limitation with the Contact objects is that they aren't configured for attachments to be correctly sent to them. This problem is documented in the Micro-

soft article "Attachment is missing from an e-mail message that is sent to a Microsoft Windows SharePoint Services 3.0 document library" ([support.microsoft.com/default.aspx?scid=kb;en-us;926891](http://support.microsoft.com/default.aspx?scid=kb;en-us;926891)), which explains that you have to set the mAPIRecipient attribute to false and the internetEncoding attribute to 1310720 before attachments will be sent correctly to the Contact object. Note that if you aren't using the DMS to enable GAL lookup, these problems don't occur. Exchange doesn't correctly deliver to the DMS-created contact because of these missing attributes.

The third problem is with the display name that gets created and ultimately finds its way into the GAL. This name is usually the primary way someone chooses an entry from the GAL. However, it's highly likely that users have similar list and site names, which means that there's little to differentiate entries in the GAL. Remember, SharePoint has nothing in the UI to prevent sites and lists having the same titles. Figure 2 shows an example of two team sites, both called Group Team Site and both having the out-of-the-box Team Discussion list mail-enabled. Which one should users choose? To pick the right one, they'd need to know the email address of the appropriate list—which would defeat the purpose of having a GAL entry in the first place. The existence of Contacts in the GAL could be a hindrance rather than a help.

The last problem I'd like to mention is the lack of governance. There's no administrative control in SharePoint over what gets put into the GAL—if you decide to enable the DMS, it's a free-for-all and chaos can

## Learning Path

### WINDOWS IT PRO RESOURCES

For more information about the finer features of SharePoint:

- "Email-Enabling SharePoint Document Libraries and Lists," InstantDoc ID 98812
- "Controlling SharePoint Access," InstantDoc ID 98470
- "Safeguard Your SharePoint Content with Data Protection Manager," InstantDoc ID 99025
- "Use Kerberos to Secure MOSS 2007," InstantDoc ID 97376
- "Coordinate a Virtualized Environment for SharePoint," InstantDoc ID 95846
- "Using SharePoint for Extranets," InstantDoc ID 99650
- "Introducing Excel Services for SharePoint," InstantDoc ID 99355

certainly reign. Can you imagine if every team site email-enabled, say, three lists? How many entries in the GAL would that equate to in your organization? At my company, that would reach the million mark. And, given the design of the DMS, all those entries would be in the same OU in AD. I'm not sure I know any AD administrators who would happily open up their AD to the potential for such abuse.

## Emailing Ease

Correctly configuring all the pieces so that email makes it to the intended list or library can be tricky, but the ability to email items into SharePoint is certainly a useful feature, and the way SharePoint handles incoming items works well. That said, make sure you communicate correct expectations about what the features are, how contacts will appear in the GAL, and so forth, so that everyone—end users, AD admins, Exchange admins—knows what to expect when you email-enable SharePoint. Good communication is especially important if you decide to use the DMS—but remember, the DMS isn't mandatory.

InstantDoc ID 100456



Figure 2: Duplicate list names with entries in the GAL



### Kevin Laahs

([kevin.laahs@hp.com](mailto:kevin.laahs@hp.com)) is a distinguished technologist at HP. He is coauthor of *Microsoft SharePoint Technologies: Planning, Design, and Implementation* (Digital Press).



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[www.ScriptLogic.com/SXP-SP](http://www.ScriptLogic.com/SXP-SP)

## SharePoint Virtual Event is Coming!

Microsoft Office SharePoint Server (MOSS) offers great functionality out of the box. But to get the most out of MOSS you need to think outside the box. This free one-day online conference will deliver the technical knowledge you need to kick MOSS up a notch.

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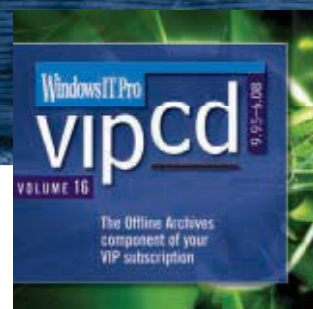
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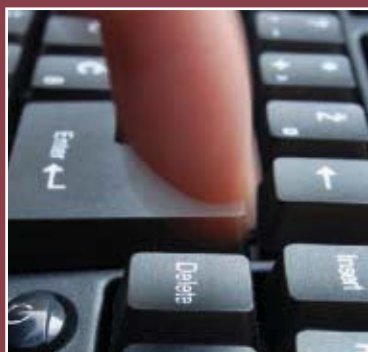
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### PRODUCT SPOTLIGHT



#### Recover All Essential Files

How often have you had a user accidentally delete a file that couldn't be recovered? Windows' Recycle Bin and backup systems can't protect files such as those deleted from network shares or from the command line or that are too large to fit into the Recycle Bin. Traditional file recovery products can recover only deleted files that are in free space and haven't been overwritten.

Diskeeper's **Undelete 2009** retains all deleted files regardless of how they were deleted. The product sends all deleted files to a separate recovery bin and keeps them for the specified length of time. "The principal functionality of Undelete is to recover a deleted file. It's essentially a program that captures deleted files and changes them to a move request," said Michael Materie, director of product management for Diskeeper. "Undelete allows you to do things like capture iterations of a Word file or things that become deleted across a network. On a file server, the recycle bin doesn't actually capture the file—it's gone."

A variety of options streamline file removal and recovery. For instance, Undelete can make only certain file types recoverable—or only files from certain folders or computers. Materie said, "The core of the product is capturing and protecting the files. There's a variety of features that allow you to fine-tune that. Undelete allows you to tailor it to the type of files you want, based on file type, location, etc."

Prices for Undelete range from \$29.95 for Desktop Client Edition to \$499.95 for Server Edition. For more information, contact Diskeeper at 818-771-1600 or visit [www.diskeeper.com](http://www.diskeeper.com).

- Backup and Recovery
- Security
- Performance



#### Spam Firewall Protects 100,000 Concurrent Email Users

Barracuda Networks launched the **Barracuda Spam Firewall 1000** for ISPs and other large organizations. The new appliance supports as many as 100,000 concurrent email users and 5,000 domains. The 2U form factor includes 200GB of message-log storage and 750GB of quarantine capacity—the largest quarantine capacity available, according to the vendor. In addition, the product features redundant hot-swap power supplies and dual-gigabit Ethernet ports. You can cluster appliances for scalability and redundancy. The Barracuda Spam Firewall 1000 costs \$89,999; subscription to Barracuda Networks' Energize Update service is \$24,299 per year. For more information, contact Barracuda Networks at 888-268-4772 or visit [www.barracuda.com](http://www.barracuda.com).

#### Asigra, Consonus Provide Business Continuity Services

Backup and recovery vendor Asigra and IT managed services provider Consonus Technologies have teamed up to offer a **Virtual Business Continuity (VBC)** service. VBC is a turnkey, pay-as-you-go protection and recovery service for enterprise data and applications. The new offering includes services such as business continuity/disaster recovery consulting, data protection, virtual or dedicated operating-environment recovery, as

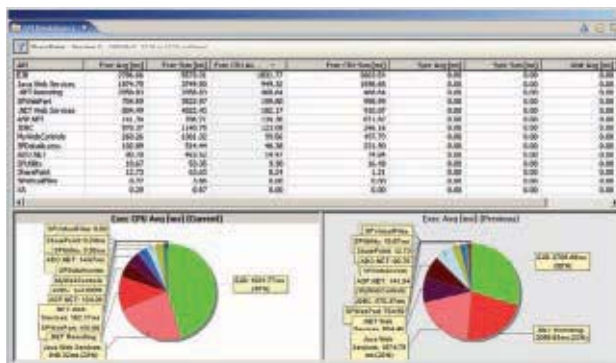
well as hot-standby computing resources and recovery servers allocated from a VMware infrastructure. VBC currently provides business continuity and disaster recovery for Microsoft Exchange Server and plans to expand services to other applications. For more information, contact Consonus ([www.consonus.com](http://www.consonus.com)) at 919-379-8000 or Asigra ([www.asigra.com](http://www.asigra.com)) at 416-736-8111, extension 101.

#### Diagnose Performance Problems with dynaTrace

dynaTrace Software's application performance management solution now supports Microsoft Office SharePoint Server (MOSS) 2007. **dynaTrace Diagnostics 2.6** enables MOSS customers to manage performance and service-level fulfillment of MOSS sites, identify slow Web Parts, and diagnose the cause of performance problems in SharePoint applications. The product works with Visual Studio and Visual Studio Team System to isolate problems early in the life cycle and enable quick resolution. For more information, contact dynaTrace Software at 781-466-8082 or visit [www.dynatrace.com](http://www.dynatrace.com).



InstantDoc ID 100442



Jeff James | [jjames@windowsitpro.com](mailto:jjames@windowsitpro.com)

Editor's Note: Send new product announcements to [products@windowsitpro.com](mailto:products@windowsitpro.com).



# Toshiba 320GB USB 2.0 Portable 2.5" External Hard Drive

If you're an administrator of a small IT shop, you're probably well aware of the advantages of portable, external USB hard drives. Large enterprises can also benefit from such drives—for example, by using them to transport virtual machines (VMs) from network to network. Whether your business is small or large, you should check out Toshiba's 320GB USB 2.0 Portable External Hard Drive.

## Putting It to the Test

At 3.2" x 0.65" x 5", weighing just 5.4 ounces, the Toshiba 320GB hard drive struck me as a neat little gadget a bit larger—although lighter—than a BlackBerry. The device has no buttons, removable panels, or visible screws, and the only output is the tiny USB port on top. The hard drive's build quality and internal shock sensor give you confidence in its ability to keep your data safe.

According to the information card included with the hard drive, the device is compatible with Windows Vista, Windows XP, and Mac OS 10.3.9 and later. To test the Toshiba hard drive, I used the included foot-long USB 2.0 cable to connect the drive to my computer. Immediately, the drive opened the preloaded NTI Shadow backup software, simultaneously with a *Creating Your First Backup* PDF guide that offered easy-to-follow steps for accomplishing manual and automatic scheduled backups to the drive.

If backup is your goal with the Toshiba drive, the NTI Shadow software is merely adequate. Although my test backup proceeded fairly smoothly (a tiny blue LED at the unit's upper right corner flickers during data transfer), the software provides only

very basic functionality. In addition, I received strange individual backup failures of certain files during my tests. For example, at one point, NTI Shadow's backup-completion notice indicated that the target 320GB drive didn't have sufficient space to back up a small video file (although the drive actually had 280GB of remaining space). I also found the backup process to be somewhat sluggish. The slow write speeds left me wishing that the 5400rpm drive included a FireWire port.

For IT use, you might find yourself deleting NTI Shadow and either replacing it with another backup solution of your choice or using the drive for a completely different purpose. As a monstrous USB storage device, the Toshiba



hard drive is absolutely top-notch and lends itself to many business purposes—cheap backup scenarios, convenient storage, VM migration, you name it. The short USB cable seems

tailor-made for laptop users who need to drag and drop large chunks of data and get going. In situations in which a 1GB USB stick just doesn't cut it, Toshiba's 320GB external hard drive is nice to have.

InstantDoc ID 100138

## Toshiba 320GB USB 2.0 Portable 2.5" External Hard Drive

**PROS:** Large capacity in exceedingly small, lightweight form factor gives this drive huge potential in many business scenarios; a bargain considering its storage capacity

**CONS:** Included NTI Shadow software is merely adequate; relatively slow write speeds; no FireWire port

**RATING:** ◆◆◆◆◆

**PRICE:** \$179

**RECOMMENDATION:** Recommended for both small and large businesses—although for separate purposes—despite a couple reservations.

**CONTACT:** Toshiba • 800-316-0920 • [www.toshiba.com](http://www.toshiba.com)

# Paul's Picks

[www.winsupersite.com](http://www.winsupersite.com)

**SUMMARIES** of in-depth product reviews on Paul Thurrott's SuperSite for Windows

## Google Chrome Beta

**PROS:** Excellent rendering engine; good performance; simple interface

**CONS:** Not easily extensible; not centrally manageable

**RATING:** ◆◆◆◆◆

**RECOMMENDATION:** The release of Google's first Web browser, Chrome, prompted fears that webmasters and web application developers would have to deal with yet another web-browser rendering engine. However, Chrome utilizes the high quality WebKit engine, offering excellent site compatibility and performance. Chrome also excels with a stripped-down UI. The Chrome home page, by default, will show you a new "tab page" that includes your nine most visited pages on the left and the sites you search on most on the right, in list format. If there's a disappointment, it's that Chrome isn't yet as extensible as its competition. And it lacks such obvious features as a full-featured bookmark management system. Still, it's a great first effort.

**CONTACT:** Google • [www.google.com](http://www.google.com)

**DISCUSSION:** [www.winsupersite.com/reviews/google\\_chrome\\_handson.asp](http://www.winsupersite.com/reviews/google_chrome_handson.asp)

## Microsoft Internet Explorer 8.0 Beta 2

**PROS:** Excellent end-user functionality and security

**CONS:** Compatibility is much worse than expected, even in Compatibility View

**RATING:** ◆◆◆◆◆

**RECOMMENDATION:** Microsoft Internet Explorer (IE) 8.0 Beta 2 is a surprisingly tepid release—its compatibility problems overshadow its many functional and security improvements. The software giant pledged to release IE 8.0 as a standards-compliant browser, and it succeeded. But I've experienced many issues with IE 8.0, whether I was using the default rendering mode or the compatibility mode, which renders sites as IE 7.0 did. Many sites, including Microsoft sites, simply don't render correctly with this browser. Until this is fixed, it limits IE 8.0's appeal.

**CONTACT:** Microsoft • 800-426-9400 • [www.microsoft.com](http://www.microsoft.com)

**DISCUSSION:** [www.winsupersite.com/reviews/ie8\\_beta2.asp](http://www.winsupersite.com/reviews/ie8_beta2.asp)

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Jason Bovberg | [jbovberg@windowsitpro.com](mailto:jbovberg@windowsitpro.com)  
Paul Thurrott | [thurrott@windowsitpro.com](mailto:thurrott@windowsitpro.com)

# Enterprise Random Password Manager 4.0

To read the full review, go to [www.windowstpro.com](http://www.windowstpro.com) and enter InstantDoc ID 100369.

When a member of your IT department leaves the company, you know you need to change critical passwords such as the domain administrator password and the Microsoft SQL Server systems administrator password—and even the four-digit combination to the lock on the server room door. However, many companies fail to change the local Administrator password on individual servers and workstations. And let's face it, who wants to take the time to do it?

That's where Lieberman Software's **Enterprise Random Password Manager (ERPM) 4.0** comes in. This product does more than just change passwords—it also manages passwords and includes a web-based password check-in/check-out procedure. Once ERPM is set up, it can even automatically change local Administrator and other service account passwords, and it provides full and secure access to the account passwords. Let me dive in and show you how ERPM works.

Installing the ERPM .msi package on a dedicated server takes only a few seconds and is straightforward. A SQL Server backend (i.e., SQL Server 2000 or later, Microsoft Data Engine) must be preinstalled and running before you begin installing ERPM. After the ERPM server product is installed, you use a configuration wizard to set up your backend database. In just a few minutes, I was connected to SQL Server, had created a new database, and had ERPM talking to SQL Server.

After ERPM is connected to SQL Server, the wizard takes you to the Deferred Processor Setup screen, where you can provide ERPM with account credentials so that it can automatically change local Administrator and service account passwords. The account that you use must have local Administrator rights to each machine in the domain so that it can, for example, change the local passwords and restart NT Services.

When ERPM is up and running, you can create and populate a group of servers

using the GUI located under the ERPM Start menu item. Although you can populate the servers manually, I really liked having the option to "link" a group of servers in ERPM to an organizational unit in Active Directory (AD). When you select this option, new objects that are added to AD will automatically show up in the ERPM group.

Next, you can set up a schedule for when the local Administrator password, service account passwords, or any other password will automatically change. ERPM

can also change passwords for OSs and database platforms other than Windows and SQL Server, including MySQL, Oracle, Linux, OS X, UNIX, Cisco, and mainframes such as AS/400 or OS/390. Passwords can be changed hourly, daily, weekly, monthly, yearly, or every *n* days. The new passwords are random, encrypted, and stored in SQL Server.

After you've configured the local Administrator password to change on a set schedule, you'll eventually find that you need to use that password. ERPM's Web Application lets you check out the password for two hours (as Figure 1 shows) if you need to gain access to a machine. If your business requires it, you can even create a workflow that forces certain people to be approved before they're given the password. After the password has been checked back in, it's changed again to keep it secure. This entire process is audited to ensure that only authorized users are viewing the password.

ERPM earns my highest praise for a simple-to-use product that fills a huge hole

in password security. The only thing that bothers me about ERPM is its high price. With a base price of \$25,000, a company with a network consisting of 50 servers and 500 workstations would have to spend almost \$30,000 to implement the product in its environment, and that price doesn't include a maintenance agreement. However, if you need to regularly change your local Administrator and service account passwords, and need to be able to check

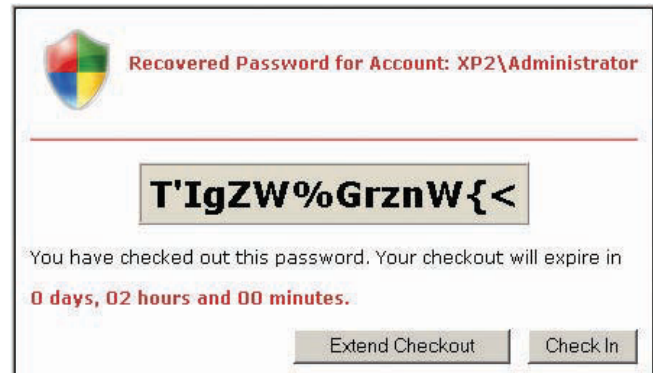


Figure 1: Checking out a password to gain access to a system

out these passwords with an audit trail, then you owe it to yourself to look into this capable product. I am extremely impressed with ERPM.

InstantDoc ID 100369

## Enterprise Random Password Manager 4.0

**PROS:** This robust product securely changes system passwords on a set schedule and lets you access passwords via a check-in/check-out procedure; easy to set up and configure; intuitive GUI

**CONS:** The product's high price

**RATING:**

**PRICE:** Starts at \$25,000 and is licensed per server and workstation/OS

**RECOMMENDATION:** If you want to secure those accounts whose passwords never get changed and need to audit who has access to those passwords, Enterprise Random Password Manager is the solution for you.

**CONTACT:** Lieberman Software • [www.liebssoft.com](http://www.liebssoft.com) • 800-829-6263



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# GPEXpert Desktop Policy Manager

To read the full review, go to [www.windowstipro.com](http://www.windowstipro.com) and enter InstantDoc ID 100401.

Group Policy is invaluable for managing Windows client systems, but it's complex and difficult to understand and work with. **GPEXpert Desktop Policy Manager (DPM)** from SDM Software attempts to make getting started with and managing client system policies easier and helps you create policies that actually do what you need them to do. I downloaded a copy of DPM 1.0 and put it through its paces to see how easy and functional it really is.

## Installation

You can choose to install DPM's two components—the DPM Service and the DPM Web Portal—on one server or place the portal on an existing web server. I first tried to install DPM on a system running Windows Server 2003 x64 Edition, but after I ran into some problems, an SDM representative told me something that the documentation didn't: A 64-bit version of DPM is not currently available. I then installed the product on a 32-bit Windows 2003 R2 system and had no further problems.

When prompted, I provided an Active Directory account that had permissions to create, edit, delete, and link Group Policy Objects (GPOs). The installation created two groups: Desktop Policy Manager Approvers and Desktop Policy Manager Users. You populate these groups to specify who can create profiles in DPM and who can approve them. The entire install process took only a couple of minutes.

## Creating Profiles

DPM uses "profiles" to refer to a particular group of policy settings. Creating a profile is a four-step, wizard-driven process. First, you specify a name, description, and scope (per user or per computer) for the profile. You then select one or more templates to determine which settings will be available for configuration through the profile. In the third step, you specify the actual settings that will define the GPO. Finally, you configure the target or targets to which the new GPO will apply.

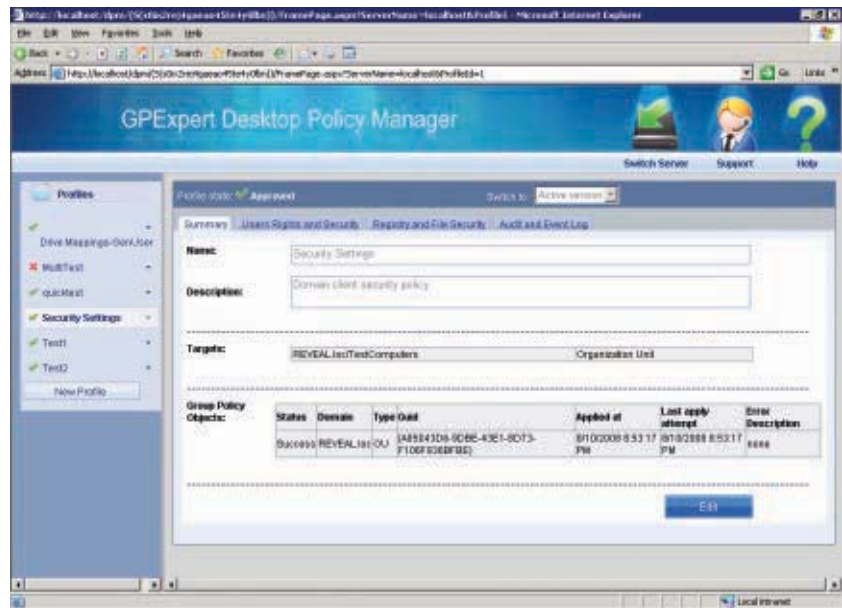


Figure 1: The Desktop Policy Manager Web Portal

DPM provides useful per-user and per-computer templates that you can use to easily manage clients via Group Policy. For example, there are templates for software deployment, group memberships, drive and printer mappings, and Internet browser security. The value of DPM lies in its use of profiles to configure policies. Profiles collect the applicable settings in one place and let you configure them without having to navigate the Microsoft tools and know which settings you need and where to find them.

## Workflow

DPM uses a workflow methodology for GPO submission and approval. Members of the Desktop Policy Manager Users Group can create GPOs, which are then submitted by default to the Desktop Policy Manager Approvers Group for approval. You can make one person a member of both groups to streamline the process.

The left pane of the DPM interface, which you can see in Figure 1, lists all profiles and their approval status. It also provides options to work with the profiles.

## Analysis

I used DPM to create an array of GPOs and tested the workflow elements using different accounts. I was impressed with the ease with which complex GPOs can be created

and targeted to user and computer objects. The GPEXpert team's foundational knowledge of policy settings pays off by letting you create GPOs quickly and know that you have an appropriately configured policy.

This product is a good choice for administrators whose time is stretched or who need to deploy desktop management policies without learning the nuances of Group Policy and its thousands of settings. DPM lets admins easily set and enforce standards for numerous important desktop configuration items. If you're already a Group Policy veteran, however, you might not get much bang for your buck.

InstantDoc ID 100401

## GPEXpert Desktop Policy Manager

**PROS:** Quick install; creates complex GPOs quickly and easily

**CONS:** No 64-bit version; somewhat pricey; not much value for experienced GPO users

**RATING:** ◆◆◆◆◆

**PRICE:** \$625 for up to 25 desktops; volume discounts available

**RECOMMENDATION:** DPM is a good choice for those who need to deploy desktop management policies without learning the nuances of Group Policy; Group Policy veterans might not get as much value from the software.

**CONTACT:** SDM Software • 415-670-9302 • [www.sdmsoftware.com](http://www.sdmsoftware.com)



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# iPhone 3G: Still Not Quite Ready for Enterprise Email

Read the complete review at [www.windowsitpro.com](http://www.windowsitpro.com), InstantDoc ID 100479.

When Apple launched the iPhone in June 2007, the company immediately grabbed an immense amount of mindshare. However, the first iPhone, cool as it was, wasn't a very good email client. It didn't sync with Microsoft Exchange Server, lacked a VPN client, and couldn't run third-party programs. Here, I review the iPhone 3G, focusing on how well it works as a mobile email device compared with Windows Mobile 6.1. For my tests, I used the iPhone 2.1 software update, released in September 2008.

## Basic Email Functionality

Let's start with email. Apple got the single biggest item right: Push email works properly. Mail arrives when it's supposed to, and you can send replies the way you're supposed to. As you can see in the sample iPhone email page in Figure 1, HTML mail displays beautifully.

That said, several rough spots exist in Apple's implementation. The most noticeable one is the poor behavior of the iPhone client when you're offline. Any attempt you make to move or delete messages when the device isn't connected via WiFi or cellular means results in an error dialog box displaying. Another shortcoming is that the iPhone client expands every folder in your mailbox when you navigate between folders or accounts, making it needlessly difficult to move directly to an individual folder.

Additionally, Apple isn't using the proper Exchange ActiveSync (EAS) verbs for message replies and forwards. EAS "smart reply" and "smart forward" verbs let applications tell the server to include the relevant message text, and the verbs also update the read/forwarded status so that other clients reflect the actions taken.

You can't flag or unflag messages for follow-up or set out-of-office messages or timings with the iPhone, as you can do with Windows Mobile 6. In addition, the iPhone 3G frequently complains if you try

to throw away a message that a client- or server-side junk filter has already moved elsewhere.

## Calendaring

Disappointingly, the iPhone's calendar functionality is probably the weakest part of its Exchange support. The iPhone can accept and act only on invitations from other users on the same Exchange server. The calendar software lets you create new meetings on your own calendar, but you cannot invite others. The iPhone limits recurrence patterns to daily, weekly, biweekly, monthly, and yearly appointments (no more first-Thursday-of-every-month designations). You can't see or set the time zone for meetings, and there's no way to find free/busy times or suggested meeting times. Windows Mobile 6.1's calendaring functionality is far superior.

## Tasks

The iPhone doesn't include a built-in tasks/to-do application. Apple missed the boat here, as this is a natural piece of functionality for a mobile device. In fact, there are dozens of such applications in Apple's iPhone App Store.

## Policy Control and Security

Apple has implemented only some parts of the EAS protocol. In the security realm, this means that iPhones will honor the password-related policies you set for EAS devices. However, the iPhone doesn't recognize the expanded policies introduced with Exchange Server 2007 SP1, and it won't work with Microsoft System Center Mobile Device Manager 2008 because the iPhone can't run the necessary client software. Windows Mobile devices warn you the first time you sync with a server that enforces a policy. The iPhone doesn't do this, so if you accept the policy, you're stuck with it. As a further annoyance, if you send a remote wipe

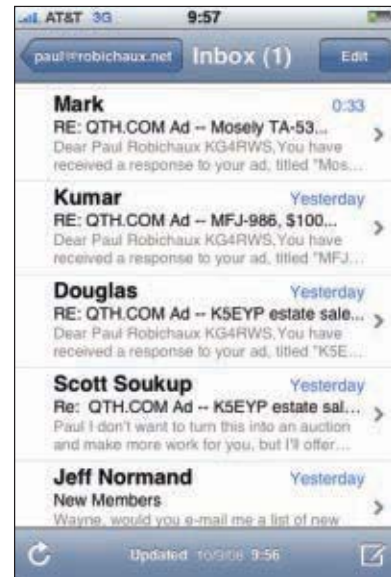


Figure 1: iPhone email client

request to the iPhone, the device will take more than two hours to finish it.

## Not Quite the Right Stuff

The iPhone does many things right: It has terrific fit and finish, the web browser is better than anything available on any other mobile device platform, and the UI is polished, fast, and easy to learn. Unfortunately, the iPhone just isn't up to par as a mobile enterprise email device. Windows Mobile 6.1's maturity gives it a clear edge in this case.

InstantDoc ID 100479

## iPhone 3G

**PROS:** Superb interface; packed with features; supports Exchange ActiveSync (EAS); easy to operate

**CONS:** Requires expensive data plans; offers poor calendar support; lacks a physical keyboard

**RATING:** ◆◆◆◆◆

**PRICE:** Monthly service plus \$299 for 16GB model and \$199 for 8GB model

**RECOMMENDATION:** The iPhone is a slick, beautifully realized smartphone that provides an unparalleled Internet-browsing experience. Its EAS support is a good start but is weak compared with the latest crop of Windows Mobile devices.

**CONTACT:** Apple • [www.apple.com](http://www.apple.com) • 408-996-1010



Paul Robichaux | [probichaux@windowsitpro.com](mailto:probichaux@windowsitpro.com)



■ Mobility

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## INSIGHTS FROM THE INDUSTRY

## Powerful Handheld Devices Open the Way for Remote Network Administration

According to Rob Woodridge, president and CEO of administration solution provider Rove, technology has “reached a point now where [mobile] devices are obviously so powerful that they’re more powerful, probably, than the first computer you ever owned.” I can certainly relate to his point. I purchased my first computer back in the early ‘90s and was pretty excited just to get email—not to mention learn about this thing called the Internet. Thinking back, it’s hard to imagine that that computer could actually do any of the things I needed. It came with 4MB of RAM (later upgraded to a whopping 8MB!) and a 120MB hard disk drive. I can’t tell you what processor it had, but I think my toaster is more powerful than that machine was.

Putting the capabilities of today’s mobile devices to good use, Rove has created **Mobile Admin**, which lets IT pros use mobile devices to provide full administrative control over their IT environments. “Handheld devices are really a great extension to your office. People are now realizing, certainly with the iPhone coming out, that there’s much more to offer than just email and calendaring,” Woodbridge said. “There’s hundreds of thousands of applications that are out there for these devices that have been just sitting there waiting for people to find them. And we happen to be one of them that fits a really amazing little niche.” Mobile Admin lets IT staff respond to problems from anywhere, and the appli-

cation interfaces with everything from Windows and Linux servers to your routers and switches. “Everything that you can do from within your firewall, in your server room, or from a terminal window, you can now do from your BlackBerry or Windows Mobile device,” Woodbridge said.

The company’s latest release, Mobile Admin 4.1, introduces enhanced access control and management capabilities intended to simplify IT administration, including Secure Shell and Telnet integration for remote terminal access, and RDP and Virtual Network Computing integration for remote, graphical administration

The target market for Mobile Admin is the large enterprise with multiple servers and systems to support. The software lets you work with a mixed environment of OSs and with different types of mobile devices. However, Woodbridge was quick to point out that “small and medium enterprises benefit from this as well. Oftentimes with thirty to three hundred people in a company, you know they’re running ragged already. So the last thing that they can afford to do is have downtime, especially prolonged downtime.” And, really, who in any size business can afford downtime? “The power is the ability to not have to be

“Everything that you can do from within your firewall, in your server room, or from a terminal window, you can now do from your BlackBerry or Windows Mobile device.”

—Rob Woodridge, president and CEO of Rove

of servers. After Mobile Admin is installed on a server, it replicates necessary components to other servers and client devices. Through Mobile Admin, IT support staff can perform tasks such as restarting services, rebooting servers, changing passwords on Exchange Server mailboxes, and reviewing event logs.

tied to a desk in order to be on call or for IT support,” Woodbridge said.

So what is Mobile Admin’s main competitor? “We’ve come to look at the status quo as the competitor—the people who still log on with their desktops, the guys who still lug around laptops . . . and take fifteen, twenty, or thirty minutes to react to something that could have taken a minute and a half from the device,” Woodbridge said. “So really it’s legacy thinking that’s our chief competitor.”

You can find out more about Mobile Admin 4.1 at [www.rovemobile.com](http://www.rovemobile.com).

—B.K. Winstead  
InstantDoc ID 100465

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## How Can IT Pros Thrive in Tough Times?

One of my three sons is a financial analyst who manages millions of dollars for his employer. He told the family in March that October would be the time when the financial markets would collapse, and he told us why. We thought he was a bit out of his mind, but heck, we love him, so we listened and nodded our heads and hoped he was wrong.

Now I'm caught between pride at his forecasting abilities and fear of what's happening across the United States and around the world. How do I deal with my fear? By doing research—which means I've read numerous blogs and articles that advise how to get through these uncertain times.

One tip I like, while not always practical, is that IT pros should focus on keeping their skills current and adding new skills. To me, that's always meant going back to school, which can get expensive unless your employer is footing the bill.

But this week, I had this major little epiphany, this moment of "duh." Hey, why not do it yourself? Why put your learning goals in your employer's lap or a college's? There's a strong history of do-it-yourself training among IT pros. I know several who regularly create their own learning plan for the skills or knowledge they want to acquire, then plot out a timetable of steps to achieve it, setting aside time for study in the morning before work or in the evening before bedtime.

I can't say for sure what will work for you, but it seems to me that an hour or two of focused attention every day can pay off in a

few months, depending on the skills and knowledge you want to acquire. Luckily, numerous resources exist online to help you, from Microsoft's virtual labs to how-to articles, white papers, e-books, podcasts, and videos from *Windows IT Pro*, among many others.

I've been enjoying the little snippets of knowledge John Savill offers in his FAQs, especially the down-and-dirty facts that are easy to digest during my lunch break. I've also recently discovered his webcasts, where he takes you step by step through technology, like his recent video "How to Use the Microsoft iSCSI Initiator Command-Line Interface," at [tinyurl.com/htu-iSCSI](http://tinyurl.com/htu-iSCSI). (Okay, I'll admit it—I'm a sucker for his British accent.)

One thing I *do* know is that IT people are wickedly resourceful when it comes to learning. It's amazing how you figure out how to deal with technology that didn't even exist a few years ago—as well as successfully deal with bugs, crashes, upgrades, crazy managers, clueless users, low budgets, and uncertainty.

So maybe I should be asking *you* for advice (though you might be too busy putting out fires to give it—I understand completely). Still, I'm curious about how you are getting by in these chaotic times. I'm also curious to know if there's anything we could do to help you do your work better. Send me an email at [cmarwitz@windowsitpro.com](mailto:cmarwitz@windowsitpro.com).

—Caroline Marwitz

InstantDoc ID 100501

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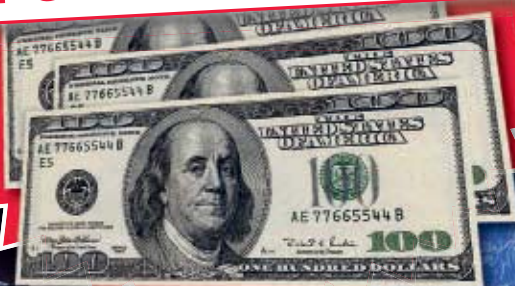


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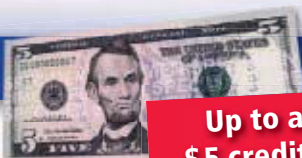
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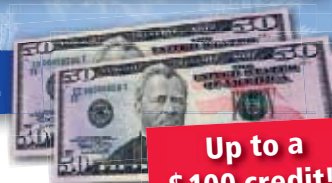
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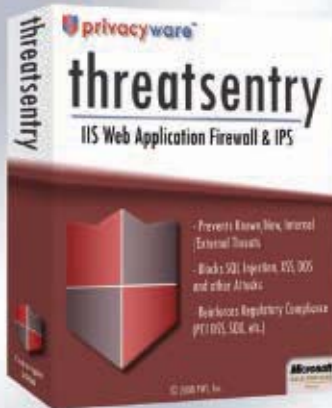
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## What Mail Server Are You Using?

A recent nonscientific Instant Poll on [www.windowsitpro.com](http://www.windowsitpro.com) asked the question "What is the primary mail server you support in your organization?" Here are the results:

- 30 percent use Exchange Server 2007
- 64 percent use Exchange Server 2003
- 2 percent use Exchange 2000 Server
- 1 percent use Exchange Server 5.5
- 4 percent use something else

These results seem to confirm what we've heard from our readers over the past 6–12 months: More than twice as many of you are sticking with Exchange 2003 instead of upgrading to 2007. From the responses to previous poll questions and from reader feedback, the big reasons for not making the switch are a desire to avoid the increased complexity of Exchange management that attends the multi-role Exchange 2007 (not to mention that whole PowerShell thing) and budget concerns due in part to the need to upgrade to 64-bit hardware. Although Exchange 2007 offers some great features, there's no incentive to upgrade if you don't need

Exchange Server is certainly the dominant mail server in operation—it's probably even more dominant among those in our *Windows IT Pro* audience than in other organizations. But even in the Windows world, a vocal minority is looking for Exchange alternatives. In last month's Everything But Microsoft column, Jeff James wrote about the Exchange-alternative market—read it at InstantDoc ID 100311. Also, here are some other articles on alternatives:

- "Groupware Alternatives to Microsoft Exchange," InstantDoc ID 50597
- "Kerio MailServer 6.1," InstantDoc ID 48792
- "PostPath Offers a Linux-based Exchange Alternative," InstantDoc ID 96670
- "What's Hot: Reader Review," SmarterMail 5.x, InstantDoc ID 100058

If you've used any of these products—or another Exchange alternative—we'd love to hear about it. What made you pick the one you did, and how has it performed? You can help other readers who are struggling with such decisions.


These results seem to confirm what we've heard from our readers over the past 6–12 months: More than twice as many of you are sticking with Exchange 2003 instead of upgrading to 2007.

those features and Exchange 2003 is serving your needs.

One thing the poll doesn't address is how many of you manage a mixed environment of Exchange 2007 and Exchange 2003. And there might be good reasons for doing so; see, for example, "Deployment Blockers for Upgrading to Exchange Server 2007" at InstantDoc ID 98509. A mixed environment lets you introduce some of Exchange 2007's new features, such as the Edge Transport role for message hygiene, at a lower cost than transitioning your whole organization, but it undoubtedly makes management more complex.

With the next Exchange release perhaps little more than a year away, how many of you plan to investigate and possibly switch to the new version when it's released? Will organizations already on Exchange 2007 be more inclined to switch (because, presumably, they've already got the hardware in place), or will Exchange 2003 admins feel it's time to leapfrog when they get the chance? Ah, perhaps that's the source of a future poll question.


—B.K. Winstead  
InstantDoc ID 100444



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# Our 10 Favorite IT Sniglets

You've heard of sniglets, right? They're words that should be in the dictionary but aren't. Rich Hall of *Saturday Night Live* fame wrote a few books full of them. We stumbled on some hilarious IT-related sniglets at WhatIs.com (whatis.techtarget.com). Here are our 10 favorites. How about yours? Send them in!

**bee break**—The act of sneaking off to the bathroom to use a BlackBerry



**blamestorming**—Sitting around in a group, discussing why a deadline was missed or a project failed, and who was responsible

**Bluetooth fairy**—Someone who walks around with a blinking Bluetooth headset permanently affixed to his or her ear



**crapplet**—A poorly written or totally useless Java applet

**e-dundancy**—Sending someone an email message while simultaneously taking part in an IM conversation with that person

**egosurf**—To search for yourself on Google or another search engine

**id10t error**—Help desk lingo for "clueless end-user"

**ohnosecond**—That instant when you realize you've pressed the wrong key and deleted hours, days, or weeks worth of work

**spamouflage**—An intentional typo, such as "Vikagra," used by spammers to fool spam filters

**treeware**—Documents made of paper, as opposed to electronic documents

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The age, in years, of the Internet



I wish this notification hadn't occurred

Where!?!?



Redefining basic assumptions

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